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LESSONS ON PRESCRIPTIONS

AND THE

ART OF PRESCRIBING.

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BY

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MACMILLAN

YRAЯИЛ ЗМАЙ

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1877

TO THE

REV. PROFESSOR HAUGHTON, M.D., F.R.S.,
FELLOW AND MEDICAL REGISTRAR OF TRINITY COLLEGE, DUBLIN,

This Little Volume is Inscribed,

AS A SLIGHT TOKEN OF THE ESTIMATION

IN WHICH

HIS LABOURS IN THE CAUSE OF MEDICAL EDUCATION

ARE HELD BY

THE AUTHOR.

PREFACE.

THE publication of these Lessons was undertaken in response to a frequently expressed desire on the part of my pupils, and, also, because I believe that there exists a very great demand for some such educational work.

The notes taken by an intelligent student have been used as the basis of this little book, and the "Lessons" are published almost word for word as they were delivered. The colloquial style may be considered a defect, but this will, I am sure, be more than counterbalanced by the individuality of the teaching.

That the publication of this little work may serve in some degree to conduce to the study of the Art of Prescribing is my very earnest hope.

W. HANDSEL GRIFFITHS.

2, UPPER FITZWILLIAM STREET, DUBLIN.

April, 1875.

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LESSONS ON PRESCRIPTIONS AND THE ART OF PRESCRIBING.

LESSON I.

INTRODUCTION.

IN commencing this brief series of "Lessons on the Art of Prescription" I will ask you to bear in mind that I shall be actuated by a desire, not only to enable you to pass your examinations creditably, but also to impart such a knowledge of the subject as will enable you to acquit yourselves creditably in whatever grade of professional life it may be your lot to fill. You must understand, however, at the outset, that although prescriptions are almost universally written in the Latin tongue, it will form no part of my plan to inculcate the elements of the grammar of that language. I must suppose that the schoolmaster has *not* been abroad, and that the examination in general education which you have all undergone has been sufficiently searching to relieve me from responsibility in this matter. At the same time, I shall not fail to ask your careful attention to those prominent rules of syntax which more immediately bear upon prescription-writing, and to indicate the more frequent idiomatic phrases of "Medical Latin."

I speak of *phraseology*, for you must understand that a knowledge of classical Latin will not enable you either to write or to translate an orthodox prescription. Literal translation of many phrases in common use may lead you into very serious error, in illustration of which I may remind you of the story which is told of the raw apprentice who translated the words, "pro re nata," as, "for the thing that is born," with results which may be better imagined than described. And now, gentlemen, let me ask you to set its true value on a knowledge of the art of prescription-writing. Remember that the dictioñ of a typical prescription is one of the most crucial tests of an accomplished physician, implying as it does the most extensive and varied professional attainments. Although the colleges and examining boards do not lay sufficient stress on the importance of prescription-writing, let not this fact deter you from an earnest study of the art. If no higher motive should actuate you, reflect that an erroneous prescription bearing your signature may place you at the mercy of the unfriendly criticism of an apothecary's apprentice.

You may ask what, after all, is the necessity for inditing prescriptions in the Latin tongue? There are at least two cogent reasons: first, a prescription in Latin can be deciphered in almost every quarter of the globe; and, secondly, it is often necessary to conceal from our patient that he is taking a certain drug.

After these prefatory remarks, which I trust will not be unprofitable, we will now commence our studies with a consideration of

THE GRAMMATICAL CONSTRUCTION OF A PRESCRIPTION.

In introducing you to this part of the subject I will follow the example of Pereira (a) by giving you a grammatical analysis of an ordinary prescription. A careful study of this will enable you to understand the *rationale* of the construction of most prescriptions. In the form of a diagram I will take each word as it occurs, parse it, and indicate the rule of syntax which it exemplifies. (*See next page.*)

The foregoing prescription, which I have modified from one in Pereira's 'Selections,' illustrates two most important rules, to which I ask your special attention: it shows that—

1st. The name of the medicine is put in the genitive when the quantity of it to be used is expressed.

2nd. The quantity is put in the accusative, being governed by the verb *Recipe*.

There yet remain for consideration some other important rules, which a few phrases of frequent occurrence will serve to illustrate:—

"*Divide in pilulas tres, quarum sumat unam omninocte.*" This little sentence is demonstrative of the rule that the relative pronoun (*quarum*) agrees with its antecedent (*pilulas*) in gender, number, and person. It moreover shows that nouns signifying the *time when* are put in the ablative, but you must bear in mind that nouns signifying *how long*, as "*per horam*," are generally put in the accusative, the prepositions *per*,

(a) 'Selecta è Præscriptis.' The author owes to this little work most of the composition of this Lesson.

DIAGRAM SHOWING THE GRAMMATICAL CONSTRUCTION OF A PRESCRIPTION.

R = RECIPES (Take)	PULVERIS (of powder)	SCAMMONIA (of scammony)	SCRUPULUM (a scruple)	DIMIDIUM (half).
Active verb, imperative mood, second person singular, agreeing with <i>Tu</i> understood; from <i>Recipio</i> , <i>ēre</i> .	Substantive, genitive singular; from <i>Pulveris</i> , <i>ēris</i> . Governed by <i>Scrupulum</i> .	Substantive, genitive singular; from <i>Scammonia</i> , <i>ā</i> . Governed by <i>Pulveris</i> .	Substantive, accusative, singular; from <i>scrupulus</i> , <i>i</i> . Governed by <i>Recipe</i> .	Adjective, accusative, singular, masculine; from <i>Dimidiatu</i> , <i>ā</i> . <i>um</i> . Agreeing with <i>Scrupulum</i> .
<i>A personal verb agrees with its nominative in number and person.</i>	<i>One substantive governs another, signifying a different thing in the genitive.</i>	<i>And the substance governed may govern another, signifying a different thing. (a)</i>	<i>A verb signifying activity governs the accusative.</i>	<i>Adjectives, participles, and pronouns agree with the substantive in gender, number and case.</i>
R (Understood).	PULVERIS (of powder) As above. Governed by <i>Grana</i> .	JALAPÆ (of jalap) Substantive, genitive singular; from <i>Jalapæ</i> , <i>ā</i> . Governed by <i>Pulveris</i> .	GRANA (grains) Substantive, accusative, plural, neuter; from <i>granum</i> , <i>i</i> . Governed by <i>Recipe</i> .	QUINQUE (five). Adjective, indeclinable.
		<i>Rule as above.</i>	<i>Rule as above.</i>	<i>Rule as above.</i>
R (Understood).	CALOMELANS (of calomel)	GRANA (grains)	TRIA (three).	TRIA (three).
	Substantive, genitive singular; from <i>Calomelans</i> . Governed by <i>Grana</i> .			
		<i>Rule as above.</i>	<i>As above.</i>	<i>As above.</i>
m = MISCE (Mix).	FIAT (Make)	PULVIS (a powder)	PURGANS	
Active verb, imperative mood, second person singular, agreeing with <i>Tu</i> understood.	Verb, imperative mood; from <i>Fio</i> , <i>īs</i> ; <i>factus sum</i> vel <i>fati fieri</i> ; <i>neuter</i> , agreeing with <i>Purgans</i> .	Substantive, nominative, singular, masculine; agreeing with <i>Purgans</i> .	Participle, nominative, singular, masculine, agreeing with <i>Purgans</i> .	

R=RECIPE (*Take*)

Active verb, imperative mood, second person singular, agreeing with *Th* understood; from *Recipio, &c.*

A personal verb agrees with its nominative in number and person.

R_y (Understood).

R₁ (Understood).

m = MISCE (Misc)

Active verb, imperative mood, second person singular, agreeing with *Th* understood; *Th* understood.

Paul as a change agent

ad, in, intra, and inter, being often expressed. While speaking of prepositions I may mention that the following govern the accusative: *ad, apud, ante, inter, per, &c.*, as "*ad uncias decem*;" whereas the following govern the ablative: *a, ab, cum, de, e or ex, pro, in, &c.*, as "*in pulvere*." The sentence "*Haustus et pilulae sumantur*" will serve to illustrate the rule that when several substantives singular are coupled by a conjunction they generally take a verb, adjective, or relative pronoun plural. I may here remind you that the conjunctions, *et, ac, atque, aut, vel, &c.*, couple like cases of nouns and moods of verbs, as "*Duabus vel tribus horis*." The following conjunctions generally govern the subjunctive mood: *ut, si, ne, donec, &c.*, as "*Ut fiat haustus*." Adjectives signifying quantity are followed by a genitive, as "*Plus calcis*."

In the sentence "*Si ægro balneo calido opus sit*" we have an exemplification of the rule that *opus, usus*, and nouns denoting necessity govern the ablative of the thing wanted (*balneo*), and the dative of that for which it is wanted (*ægro*). The sentence "*Utatur balneo frigido*" is also an exemplification of the rule that *utor* and some other words (participles, *natus, editus, creatus, &c.*) govern the ablative.

The sentence "*Misturæ dimidium*" demonstrates the fact that words denoting a part govern the genitive; remember also that adjectives of desire, fear, memory, or knowledge, &c., or the contraries of these, govern the genitive, as "*Timidus febris*." One verb governs another in the infinitive, thus, "*Mistura quam debet capere æger*."

The words "*More solito*," which are so frequently

met with in prescriptions, are indicative of the rule that words expressive of cause, manner, or instrument, are put in the ablative.

I have lastly to remind you that adverbs of quantity (how much?), time (how long?), and place (where?), govern the genitive, as "*Quantum sufficiat aquæ.*"

We have now rapidly gone over most of the principal rules of syntax, a knowledge of which is necessary for constructing a correct grammatical prescription. I by no means pretend to say that I have given you a complete synopsis of *all* the rules of syntax, but I hope I have sufficiently indicated the more important of these laws. I think that if you will take the pains to master these few precepts you will seldom be at a loss to express yourselves in accordance with the accepted rules of Latin construction.

LESSON II.

PARTS OF A PRESCRIPTION.

A model prescription consists of four parts, viz. :—

1. *The Superscription*, which simply consists of the letter **B**, a sign which we have learned in our first Lesson to regard as an abbreviation of the imperative mood of the verb *Recipio*.

2. *The Inscription*, the names and doses of the substances prescribed.

3. *The Subscription*, the directions to the dispenser.

4. *The Signature*, the instructions for the patient.

The Superscription requires no other comment than that which we have already accorded to it, but I have to call your attention to some important points in connection with the *Inscription*.

The ingredients of a typical prescription are supposed to have a representative of the following :—

- (a) The *Basis*, or active ingredient.
- (b) The *Adjuvant*, or the auxiliary.
- (c) The *Corrective*.
- (d) The *Vehicle*.

I cannot adduce a better example of the foregoing principles than the Pharmacopœial representative of the ordinary “black draught,” thus—

<i>Superscription . . .</i>	<i>R.</i>
	Magnesiae sulphatis, uncias quatuor— <i>Basis</i> .
	Tincturæ sennæ, uncias duas cum semisse— <i>Adjuvant</i> .
<i>Inscription . . .</i>	Tincturæ cardamomi compositæ, drachmas decem— <i>Corrective</i> .
	Extracti glycyrrhizæ, semi unciam.
	Infusi sennæ, ad uncias viginti— <i>Vehicle</i> .
<i>Subscription . . .</i>	Misce, fiat mistura.
<i>Signature . . .</i>	Cujus capiat æger cochlearia duo magna bis terve in horâ, donec adsit catharsis.

Patient's Name.

Initials.

Date.

Now, you are not to suppose that *every* prescription must of necessity have an adjuvant and a corrective as well as a basis and a vehicle. It was the habit of our ancestors to prescribe a multitude of substances with an heroic disregard of compatibility, whether chemical, physical, or therapeutical, in the hope, it is surmised, that some one of the multifarious ingredients would knock off the disease, whatever that might be. Now, ho

ever, the ingredients of a prescription seldom exceed the four forms which I have specified, and oftentimes there are even fewer ingredients than these. Indeed, it is a question whether we are not falling into the opposite extreme, and that, under the pretence of seeking after simplicity, we do not frequently forego the undoubted advantages of judicious combination. It would be ungenerous to insinuate that "affected simplicity" is sometimes a cloak for gross ignorance. When speaking by-and-by of the principles of combination I shall have occasion to revert to this subject. I will conclude this brief lesson by asking you, whenever you indite a prescription, to bear in mind the famous precept of Asclepiades, "*Curare cito, tuto, et jucunde.*"

LESSON III.

SIGNS AND SYMBOLS.

There are certain signs and symbols in every-day use by prescribers with which it is absolutely necessary that you should be thoroughly conversant. They are as follows:—

gr. = Granum, a grain, 1-480th part of a troy ounce.

ʒj. = Scrupulum, a scruple, 20 grains troy.

ʒj. = Drachma, a drachm, 3 scruples, or in liquids, 1-8th of an ounce measure.

ʒj. = Uncia, an ounce troy, 480 grains.

lbj. = Libra, a pound, 12 ounces troy.

m. = Minimum, a minim, 1-60th part of a fluid drachm.

gtt. = Gutta, a drop.

Oj. = Octarius, a pint, 20 ounces.

Cj. = Congius, a gallon

The letter *f.* or *fl.*, when prefixed to some of the above signs, signifies "fluid;" and the letters *ss.*, when affixed, signify "half."

Although, in the British Pharmacopœia of 1864, "all who prescribe and dispense medicines are recommended to discontinue henceforth the use of the drachm and scruple weights," the signs representing these weights have been found so convenient, and have been so familiar to prescribers, that generations must pass away before these venerable symbols will be discarded.

The weights and measures of the British Pharmacopœia, with their symbols, are as follows :—

Weights.

1 pound	...	lb.	=	16 ounces	=	7,000 grains.
1 ounce	...	oz.	...	...	=	437.5 grains.
1 grain	...	gr.	...	...	=	1 grain.

Measures.

1 gallon	...	...	C.	=	8 pints.
1 pint	...	...	O.	=	20 fluid ounces.
1 fluid ounce	...	...	fl. oz.	=	8 fluid drachms.
1 fluid drachm	...	...	fl. drm.	=	60 minimis.
1 minim	...	...	min.	=	1 minim.

Before we leave this part of our subject I must caution you to study legibility when writing any of the above signs. You can easily understand that serious errors may result from careless calligraphy—thus a badly-formed 3 might be mistaken for a 5, and so on. Grave mishaps innumerable have resulted from slovenly writing.

DOMESTIC MEASURES.

As a rule, it would never do to give our patients

such minute directions as to take "a drachm," for instance, or even "an ounce" of a medicine, and so, for convenience, we order them to measure the quantity to be taken in certain utensils in common domestic use. These utensils are accredited with measuring tolerably correct quantities, thus:—

Teaspoonful	=	1 fluid drachm.
Dessertspoonful	=	2 fluid drachms.
Tablespoonful	=	4 fluid drachms.
Wineglassful	=	1½ to 2 fluid ounces.
Teacupful	=	5 fluid ounces.
Breakfastcupful	=	8 fluid ounces.
Tumbler	=	10 to 12 fluid ounces.

These measures can by no means be relied on, and if you are ordering a medicine of which you desire *accurate* quantities to be taken, it would be infinitely preferable to adopt the system of *graduated bottles*.

Perhaps this is the proper place to advert to the practice of prescribing "drops" of a substance. A "drop" is a very indefinite measure indeed, and the idea that it is equal to "about a minim" is in the majority of cases most erroneous: thus, a fluid drachm of distilled water is equivalent to forty-five drops, while a fluid drachm of laudanum will yield one hundred and twenty drops.

THE NUMERAL ADJECTIVES.

Under certain circumstances, in prescribing and at examinations, you will be required to write out in unabridged Latin the quantities of the drugs or preparations ordered. Perhaps the time will not be lost in refreshing your memories with regard to these

numeral adjectives. The following little tabular statement will suffice :—

<i>Unus</i> , one.	<i>Octodecim</i> , eighteen.
<i>Duo</i> , two.	<i>Novemdecim</i> , nineteen.
<i>Tres</i> , three.	<i>Viginti</i> , twenty.
<i>Quatuor</i> , four.	<i>Unus et viginti</i> , or } twenty-one.
<i>Quinque</i> , five.	<i>Viginti unus</i> } <i>Duo et viginti</i> , or } twenty-two.
<i>Sex</i> , six.	<i>Viginti duo</i>
<i>Septem</i> , seven.	<i>&c.</i>
<i>Octo</i> , eight.	<i>Triginta</i> , thirty.
<i>Novem</i> , nine.	<i>Quadraginta</i> , forty.
<i>Decem</i> , ten.	<i>Quinquaginta</i> , fifty.
<i>Undecim</i> , eleven.	<i>Sexaginta</i> , sixty.
<i>Duodecim</i> , twelve.	<i>Septuaginta</i> , seventy.
<i>Tredecim</i> , thirteen.	<i>Octoginta</i> , eighty.
<i>Quatuordecim</i> , fourteen.	<i>Nonaginta</i> , ninety.
<i>Quindecim</i> , fifteen.	<i>Centum</i> , a hundred.
<i>Sexdecim</i> , sixteen.	<i>Mille</i> , a thousand.
<i>Septendecim</i> , seventeen.	

For the declension of declinable numeral adjectives (*unus*, *duo*, and *tres*) I must refer you to your Latin Grammar.

In conclusion, I must remind you that the Latin numerals are employed in prescription—thus: *i.*, *ij.*, *ijj.*, *iv.*, *v.*, *vi.*, and so on.

In the next Lesson we will study a list of the terms most frequently employed in prescription-writing, and I will draw your special attention to the contractions or abbreviations of them in vogue among physicians.

LESSON IV.

WORDS AND PHRASES MOST FREQUENTLY EMPLOYED,
AND THE ABBREVIATIONS AND CONTRACTIONS OF
THEM.

I fear that this lesson will be considered the most uninteresting of the series ; but I have to assure you that it is by no means the least important. I have drawn out for you a list of the terms most frequently employed in prescription-writing, and I have indicated in this list the abbreviations of them, which, either from hurry, laziness, or ignorance, prescribers are in the habit of adopting.

WORD OR PHRASE.	CONTRACTION.	MEANING.
Abdomen . . .	Abdom. . . .	The belly
Absente febre . .	Abs. febr. . . .	In the absence of fever
Ad duas vices . .	Ad 2 vic. . . .	At twice taking
Ad tertiam vicem . .	Ad 3tiam vicem . .	For three times
Ad defunctionem animi	Ad def. animi. . .	To fainting
Ad libitum . . .	Ad lib. . . .	At pleasure
Adde, addantur, addendus, addendo	Add. . . .	Add, let be added, to be added, by adding
Admove, admoveatur, admoveantur	Admov. . . .	Apply, let it be applied, let them be applied
Adstante febre . . .	Adst. febre. . . .	When the fever is on
Adversum	Adv.	Against

WORD OR PHRASE.	CONTRACTION.	MEANING.
Aggrediente febre . .	Aggred. febre. . .	While the fever is coming on
Aliquot . . . . .	. . . . .	Some
Alternis horis . . .	. . . . .	Every other hour
Amplus . . . . .	. . . . .	Large
Ana	A, ãa	Of each
Aqua - astricta, bul-liens, communis, fervens, fluviatilis, fontalis (or fontana, or fontis), marina, nivalis, pluviatilis, (or pluvialis)	Aq. - astr., bull., com., ferv., fluv., font., mar., niv., pluv.	Water - frozen, boiling, common, hot, river, spring, sea, snow, rain
Aut . . . . .	. . . . .	Or
Balneum mariae or maris	B. M.	A warm water bath
Balneum vaporosum or vaporis	B. V.	A vapour bath
Bene . . . . .	. . . . .	Well
Bibe	Bib.	Drink (thou)
Biduum . . . . .	. . . . .	Two days
Bis indies	Bis. ind.	Twice a day
Bolus	Bol.	A large pill
Bulliat, bulliant . .	Bull.	Let boil
Calefactus . . . . .	. . . . .	Warmed
Capiat	Cap.	Let the patient take
Cibus. . . . .	. . . . .	Food
Cochlear, or coch-leare, cochleatim	Coch., cochleat.	A spoonful, by spoonfuls
Cochleare amplum, magnum, medium, or modicum, par-vum	Coch. amp., coch. mag., coch. med., coch. parv.	A tablespoonful, a large spoonful, a dessertspoonful, a teaspoonful
Coctio . . . . .	. . . . .	Boiling
Cola, colatus, cole-tur, colentur	Col., colat., colet., colent.	Strain, strained, let it be strained, let them be strained
Collyrium	Coll.	An eye-wash
Collutorium	Collut.	A mouth-wash
Compositus	Comp.	Compounded

WORD OR PHRASE	CONTRACTED	MEANING
Cougar	Coug.	A gallon
Conserua	Conss.	A conserve; also keep (thou)
Continuatur reme- dia	Cont. rem.	Let the medicines be continued
Coque, coquuntar .	Coq. . . .	Boil, let them be boiled
Cortex	Cort. . . .	Bark
Cras, crastines .	Cras. crast.	Early, for to-morrow
Cujus, cajeslibet .	Cuj. . . .	Of which, of any
Cum	Ā.	With
Cyathus vel cyathus vinarius	Cyath., c. vinar.	A wine glass
Da, detar	Da. det.	Give, let be given
De		Of, or from
Debita spissitudo .	Deb. spiss.	Of proper consistence
Decanta	Dec.	Pour off
Decocum	Decoc.	A decoction
Decubitus	Decub.	Lying down
De die in diem .	De d. in d.	From day to day
Deglutiatur	Deglut.	May, or let be, swallowed
Defectiones alvi	Dej. alv.	Stools
Diebus alternis	Dieb. alt.	Every other day
Dilue, dilutus	Dil.	Dilute (thou), diluted
Diluculo	Diluc.	At break of day
Dimidius	Dim.	One-half
Directione propriâ .	D. P., or direc. prop.	With a proper direction
Dividatur in partes sequales	D. in p. seq.	Let it be divided into equal parts
Dolor		Pain
Donec		Until
Domis	D.	A dose
Durante dolore		While the pain lasts
Edulcorata	Ed.	Edulcorated
Ejundem	Ejusd.	Of the same
Klectuarium	Elect.	An electuary
Emesis		Vomiting
Enema	En.	An enema

WORD OR PHRASE.	CONTRACTION.	MEANING.
Evanuerit . . . . .	. . . . .	Shall have disappeared
Exhibeatur	Exhib.	Let it be exhibited
Extende super alumen mollem	Ext. sup. alut. moll.	Spread thou upon soft leather
Extractum	Extr.	An extract
Fac, fiat, fiant	F. ft.	Make, let it be made, let them be made
Febris . . . . .	. . . . .	Fever
Fervens	Ferv.	Boiling
Fiat lege artis	F. L. A.	Let it be made by the rules of art
Fiat secundum artis regulas	F. S. A. R.	Let it be made according to the rules of art
Filtram, filtra . . . . .	. . . . .	A filter, filter (thou)
Fluidus	Fl.	Liquid
Frustillatim	Frust.	In little pieces
Gargarisma	Garg.	A gargle
Gradatim . . . . .	. . . . .	By degrees
Gratus . . . . .	. . . . .	Pleasant
Gutta.	Gtt.	A drop
Guttatim	Guttat.	By drops
Guttis quibusdam	Gutt. quibusd.	With a few drops
Haustus	Haust.	A draught
Hebdomada . . . . .	. . . . .	A week
Heri . . . . .	. . . . .	Yesterday
Hic, haec, hoc . . . . .	. . . . .	This
Hirudo . . . . .	. . . . .	A leech
Hora.	H.	An hour
Horis intermediis	Hor. interm.	In the intermediate hours
Idem . . . . .	. . . . .	The same
Imprimis . . . . .	. . . . .	First
In dies	In d.	From day to day, daily
Incide, incisus	Inc.	Cut (thou), being cut
Infunde	Inf.	Pour in
Infusum	Infus.	An infusion
Injectio . . . . .	. . . . .	An injection
Instar . . . . .	. . . . .	As big as

WORD OR PHRASE.	CONTRACTION.	MEANING.
Inter		Between
Internus		Inner
Jam		Now
Julepus, julepum, julapium	Jul.	A julep
Juxta		Near to
Lac		Milk
Lana		Flannel
Languor		Faintness
Lateri dolenti	Lat. dol.	To the painful side
Lectus		A bed
Linimentum	Liniment.	A liniment
Linteum		Lint
Liquor	Liq.	A solution
Lotio		A lotion
Magnus	Mag.	Large
Mane, mane primo		In the morning, very early in the morning
Manipulus	M. or man.	A handful
Manus		The hand
Massa, massa pilularis	M., m. p.	A mass, a pill-mass
Matutinus		In the morning
Medius		Middle
Mensurâ		By measure
Mica panis	Mic. pan.	Crumb of bread
Minimum	M. or min.	A minim
Minutum.		A minute
Misce.	M.	Mix
Mistura	Mist.	A mixture
Mitte, mittatur, mit-tantur		Send, let it be sent, let them be sent
Modicus		Middle-sized
Modo præscripto	Mod. præsc.	In the manner prescribed
Mora		Delay
More dictu, more solito	More dict., more sol.	In the manner directed, in the usual manner
Mortarium		A mortar
Necnon		Also

WORD OR PHRASE.	CONTRACTION.	MEANING.
Nisi . . . . .	. . . . .	Unless
Nox, noctis . . . . .	. . . . .	Night
Nucha . . . . .	. . . . .	The nape of the neck
Numerus	No.	Number
Octavus . . . . .	. . . . .	Eighth
Omni hora, omni bi- horio, omni quad- rante horae	Omn. hor., omn. bih., omn. quadr. hor.	Every hour, every two hours, every quarter of an hour
Opus . . . . .	. . . . .	Need or occasion
Pars . . . . .	. . . . .	A part
Partes æquales	P. æ.	Equal parts
Partitis vicibus	Part. vic.	In divided doses
Parvus . . . . .	. . . . .	Little
Pediluvium . . . . .	. . . . .	A foot bath
Pilula . . . . .	. . . . .	A pill
Poculum, pocillum	Pocul., pocill.	A cup, a little cup
Pondere	P.	By weight
Potus . . . . .	. . . . .	Drink
Primus . . . . .	. . . . .	First
Pro ratione etatis	P. rat. et.	According to the age of the patient
Pro re nata	P. r. n.	Occasionally
Pugillus	Pug.	A pinch
Pulvis	Pulv.	A powder
Quantum lubet, or quantum placet, or quantum vis	Q. l., q. p., q. v.	As much as you please
Quantum sufficiat, or quantum satis	Q. s.	As much as is suffi- cient
Quâquâ horâ . . . . .	. . . . .	Each hour
Quartus . . . . .	. . . . .	Fourth
Quintus . . . . .	. . . . .	Fifth
Quorum	Quor.	Of which
Ratio . . . . .	. . . . .	Proportion
Redactus in pulver- em, redigatur in pulverem	Red. in pulv., re- dig. in pulv.	Let it be reduced to powder
Reliquus . . . . .	. . . . .	Remaining
Repetatur, repetan- tur	Repet.	Let it be repeated, let them be repeated
Saltem . . . . .	. . . . .	At least

WORD OR PHRASE.	CONTRACTION.	MEANING.
Scatula	Scat.	A box
Secundum artem, secundum naturam	S. A., S. N.	According to art, according to nature
Secundus. . . . .	. . . . .	Second
Semel . . . . .	. . . . .	Once
Semis	Ss.	A half
Sep. imana . . . . .	. . . . .	A week
Sesuncia	Sesunc.	An ounce and a half
Sesquihora	Sesquih.	An hour and a half
Sextus . . . . .	. . . . .	Sixth
Si . . . . .	. . . . .	If
Simul. . . . .	. . . . .	Together
Sine . . . . .	. . . . .	Without
Singularum	Sing.	Of each
Si non valeat	Si n. val.	If it does not answer
Si opus sit	Si op. sit	If necessary
Si vires permittant	Si vir. perm.	If the strength will bear it
Sit . . . . .	. . . . .	Let it be
Solus . . . . .	. . . . .	Alone
Solvo, solvere, solutus	. . . . .	To dissolve, dissolved
Somnus . . . . .	. . . . .	Sleep
Statim	Stat.	Immediately
Stet, stent	St.	Let it stand, let them stand
Subactus . . . . .	. . . . .	Subdued
Subinde . . . . .	. . . . .	Frequently
Sume, sumat, sumatur, sumantur, sumendum	Sum.	Take (thou), let him take, let it be taken, let them be taken, to be taken
Supra. . . . .	. . . . .	Above
Tabella	Tabel.	A lozenge
Talis . . . . .	. . . . .	Such a one
Tempus . . . . .	. . . . .	Time or temple
Tertius . . . . .	. . . . .	Third
Tinctura	Tinct., or tra.	A tincture
Triduum . . . . .	. . . . .	Three days
Tritura	Trit.	Triturate
Trochisci	Troc.	Lozenges

WORD OR PHRASE.	CONTRACTION.	MEANING.
Tero	•	To rub
Tussis	•	A cough
Ultima præscripta	Ult. præsc.	The last ordered
Una	•	Together
Utor	•	To make use of
Vas vitrium	•	A glass vessel
Vehiculum	•	A vehicle
Vesper	Vesp.	The evening
Vices	•	Turns
Vitellus	•	Yolk
Vitrium	•	Glass
Vomitio urgente.	Vom. urg.	The vomiting being troublesome

It not unfrequently happens that abbreviations are productive of direful errors, and there are some special instances to which I will now ask your careful attention. If you desired to prescribe acidum hydrochloricum, you might possibly write "*acid. hydroc.*"—an abbreviation which would equally stand for acidum hydrocyanicum, and grave consequences might ensue from such a reading. Again, in writing the words *aqua fontis*, the *n* should be perfectly legible, lest the words might be mistaken for *aqua fortis*. You should be careful when writing colchicum or colocynth not to use the abbreviation "*col.*," for the dispenser would then be left in doubt as to which drug was intended. I have seen several prescriptions in which the contraction "*hydr.*" occurred—a word which might mean either hydrargyrum, hydras, hydriodas, hydrochloricum, or hydrocyanicum. The abbreviation "*hydr. bic.*" might be intended for the bichloride or bicyanide of mercury, and "*hydr. bin.*" would equally signify the

biniiodide or the binioxide of that metal. Short a time as hydrate of chloral has been in use, the words "*hyd. chlor.*," which were written for it, have been taken to indicate corrosive sublimate.

The foregoing are some of the more important instances of the errors which might ensue from the careless or injudicious use of abbreviations. I trust that they will demonstrate forcibly the necessity of carefully considering the significance which *might* be attributed to every abbreviation you make use of.

LESSON V.

THE PRINCIPLES OF MEDICINAL COMBINATION.

Over sixty years ago Dr. John Ayrton Paris published his 'Pharmacologia,' many copies of which can yet be had. In this work the principles of medicinal combination have been treated in so exhaustive and masterly a style, that no subsequent writer has found room for improvement. I shall not attempt originality, therefore, in this lesson, but will endeavour as briefly, but as faithfully as possible, to give you the pith of Dr. Paris's teachings. I should, however, advise you to endeavour to procure for yourselves a copy of this work, which is as intelligible to the most junior student as it is pregnant with interest to the veteran practitioner, every page of it teeming with fact, observation, and suggestion.

The objects which we seek to obtain by combining medicines are fourfold :—

1st.—To augment, correct, or modify the action of a medicine.

2nd.—To obtain the joint operation of two or more medicines.

3rd.—To obtain a new remedy.

4th.—To afford a suitable form.

These objects we will consider *seriatim*.

I. TO AUGMENT, CORRECT, OR MODIFY THE ACTION OF A MEDICINE.

We can AUGMENT the action of a medicine by *combining different preparations of it*, as, for instance, when the infusion and tincture of the same substance are ordered, a combination which is indicated when all the active principles are not soluble in the same vehicle. Another means of increasing the action of a substance is *by combining with it substances which produce similar effects*. To Dr. Fordyce we are indebted for the enunciation of the law that “combination of similar remedies will produce a more certain, speedy, and considerable effect than an equivalent dose of any single one.” Neither ipecacuanha nor tartar emetic alone are so certain as a mixture of the two when we desire to produce emesis. Every class of therapeutic agents affords numerous examples of the truth of this law. I trust that I have only to mention that the subject offers a wide field for original research to stimulate you to seek out for yourselves fresh illustrations of the law of Fordyce. A third and last

mode of increasing the action of a medicine is *by combining with it substances of a different nature which can in some unknown manner enhance its action.* The diuretic effect of squill is increased by a mercurial; ipecacuanha assists the purgative action of jalap; and opium renders more certain the action of mercury. Other examples innumerable might be quoted as afforded both by officinal and magistral formulæ.

We can **CORRECT** or **MODIFY** the action of a medicine *by chemically neutralising, or mechanically separating, the offending ingredient, or by combining with it some substance capable of protecting the stomach or system against its injurious effects.* Thus, we correct the griping tendency of purgatives by combining with them aromatics or essential oils; the drastic properties of colocynth may be obviated by admixture with camphor. The griping of senna and resinous purgatives may be prevented by alkaline salts; and several substances can be deprived of acrimony by trituration with mucilage, barley-water, or milk, as exemplified by the *mistura scammonii* of the *Pharmacopœia*. Again, the tendency of mercurials to affect the bowels may be corrected by opium, while the constipating effects of the latter drug may be best combated by combination with aloes.

II. TO OBTAIN THE CO-OPERATION OF TWO OR MORE MEDICINES.

This we do *by combining substances which have a different mode of action, and which effect the same or different results.* As an example of a combination of

substances which effect the same ends by different means we may instance the admixture of purgatives, some of which act by increasing the peristaltic action of the intestines, others by increasing the intestinal mucous secretion ; and others by increasing the secretion of the neighbouring organs. It would be useless to cite here instances of the combination of medicines having different actions, and *intended to obviate different symptoms*. In future lessons we shall have frequent opportunities of studying examples in detail. I will, however, bid you beware of falling into the habit of prescribing for *symptoms only* instead of for the *causes* which produce them. It is said of an eminent physician, formerly resident in this city, that when writing a prescription he used to give a remedy for each symptom as recounted by the patient. I have seen some few formulæ emanating from this gentleman, and really it is difficult to conceive how such marvellously incongruous compositions could otherwise have been indited. I am unable to say absolutely what the effects of such mixtures were upon the patient, but unless all the laws of medicinal combination were subverted in favour of this practitioner and his clients, I should say that they must have been worse than useless. Above all things, be on your guard against falling into the error of prescribing substances which possess essentially *opposite therapeutic properties, and which are medicinally inconsistent or physiologically incompatible* ; none of you, I trust, would prescribe prussic acid with strychnine ; it was the lot of Dr. Paris to behold a prescription in which these were the principal ingredients.

III. TO OBTAIN A NEW REMEDY NOT AFFORDED BY ANY SINGLE SUBSTANCE.

By combining medicines which possess different properties, and which by their union produce effects not exerted by either separately and not attributable to chemical action. The officinal pulvis ipecacuanhæ compositus will serve as an illustration. This preparation is remarkable for its diaphoretic properties, whilst neither of its ingredients, opium nor ipecacuanha, when taken separately, exert any powerful action on the skin. The development of this property by the union of these substances is inexplicable on the ground of chemical reaction. We can, however, produce new remedies by combining substances which are capable of reacting chemically on each other. My namesake's mixture, the mistura ferri composita of the Pharmacopœia, is a good example; in this preparation sulphate of iron and carbonate of potash are employed, and these reacting on each other form carbonate of iron and sulphate of potash.

IV. TO AFFORD A SUITABLE FORM.

It is not the least of the duties of the prescriber to order his remedy in a convenient and agreeable as well as in an efficacious form. When writing a prescription always have regard to the taste, appearance, consistence, or equable mixture, and preservation of the medicine. While it is thus our duty, as far as possible, to consult the tastes, and even the caprices of our patients, we must never consent to sacrifice the

efficacy of a medicine to its taste or appearance. It would seem to be necessary thus to admonish you, for Dr. Paris has known medical men who, if they considered it needful to recommend a shower-bath, would suggest that the disagreeable sensations occasioned thereby might be obviated by an umbrella.

In this lesson I have purposely avoided giving more than one or two illustrations of the laws of combination, inasmuch as in future lessons we shall have frequent opportunities of studying further exemplifications of them.

LESSON VI.

INCOMPATIBILITY.

Substances are said to be incompatible when their combination gives rise to chemical changes, a new compound being formed which is either inert or possessed of distinct properties. Chemical incompatibility, however, does not always signify therapeutical inertness. Substances which are chemically incompatible are sometimes intentionally combined in order to obtain a new compound ; as, for instance, in the officinal *mistura ferri composita* a decomposition occurs between the sulphate of iron and carbonate of potash.

The subject of incompatibility is, as Parrish says, "too much of a stumbling-block to the student." The older text-books of *materia medica* contained a long list of so-called incompatibles, which the unfortunate student was expected to commit to his already over-

burdened memory. It is now known that many of these "incompatibles" are not incompatible at all, and that many of them might be excluded from the list, from the extreme unlikelihood of anyone ever prescribing them together.

Incompatibility may be threefold, viz. :—

1. Chemical.
2. Pharmaceutical.
3. Physiological and therapeutical.

We have given above the signification of *chemical* incompatibility. By *pharmaceutical* incompatibility we mean combination of such substances as are physically incapable of mixing ; thus, if nitrous ether be added to tincture of guaiacum a gelatinous mass will result, or if resinous tinctures be added to aqueous solutions the resins will separate. The following are some of the more striking examples of pharmaceutical incompatibles, and they should be carefully remembered by the prescriber :—

Compound infusion of cinchona with compound infusion of gentian.

Infusions generally with metallic salts.

Tinctures made with strong alcohol, with those made with weak alcohol, and with infusions and aqueous liquids.

Essential oils with aqueous liquids exceeding one drop to f. ʒj.

Fixed oils and copaiba with aqueous liquids, except with excipients.

In our last lesson we alluded to the subject of *physiological* or *therapeutical* incompatibility. By this term we imply combination of such substances as

possess opposite therapeutical and physiological properties, and which are medicinally inconsistent; for instance, belladonna would be physiologically incompatible with calabar bean.

I will now ask your attention to the following simple rules, a knowledge of which will be sufficient to guard you from the commission of any flagrant errors in the matter of chemical incompatibility.

LAWS OF CHEMICAL INCOMPATIBILITY.

1. Two salts in solution may form, by the interchange of their acids and bases, two insoluble salts which are precipitated.

2. When two salts in solution form, by the interchange of their acids and basis, a soluble and an insoluble salt, the latter will generally be precipitated, or may form with the soluble salt a double salt.

I have before me two clear solutions, one of chloride of barium, the other of sulphate of soda. As I mix them you observe the formation of a copious precipitate; this is insoluble sulphate of barium. If we now filter off the clear fluid, we shall find it to be a solution of chloride of sodium.

3. When two salts in solution do not give rise to an insoluble salt no precipitate will result, though there may be decomposition.

4. An acid will decompose a salt—

(a) If the acid added be more fixed or more soluble than that of the salt.

(b) If the acid added can form an insoluble or a less soluble compound with the base of the salt.

(c) If the acid added possess a greater affinity for the base of the salt.

(d) If the acid of the salt be gaseous.

I have in one vessel dilute sulphuric acid, and in another vessel I have some liquor ammoniæ acetatis. You observe that, as I mix them, acetic acid is given off, and the fluid on examination will prove to contain sulphate of ammonia.

5. Oxides of the alkalies decompose salts of the metals proper and of the alkaloids, and precipitate their bases, or the base may be soluble in excess of the alkali.

Here is a solution of sulphate of zinc ; as I add to it a little liquor potassæ, you see the formation of a precipitate of oxide of zinc ; as I add more of the liquor potassæ, the precipitate becomes dissolved.

6. Metallic oxides combine with acids to form salts.

7. Vegetable substances containing tannic or gallic acids precipitate albumen, vegetable alkaloids, and most of the metallic oxides, and form with salts of iron inky solutions. Substances containing tannic acid also precipitate gelatine.

8. Glucosides are incompatible with free acids or emulsions.

As a general rule the following substances should be prescribed alone, and are best given in simple solution :—

Acid. hydrocyanic. dil.

Acid. nitro-hydroc. dil.

Antim. tart.

Liq. calcis

Liq. potassæ

Liq. potassæ arseniatis

Liq. ferri pernit.

Tinct. ferri perchlor.

Tinct. iodi.

Potassii bromid.

Google

Potass*ii* iodid.
Potass*ii* permanganat.
Potass*ii* acetat.
Zinci acetat.

~~Magnes*ii* acetat.~~
~~Magnes*ii* iodat.~~
~~Calci*ii* acetat.~~

I now propose to pass in review some of the more important instances of individual incompatibility, but in this survey I shall generally omit instances bearing on the rules we have above enunciated.

ACID. HYDROCYANIC DIL.—This is not unfrequently prescribed with alkalies; a cyanide of the metal is thus formed, which is not less active than the acid itself.

ACID. PHOSPH. DIL. may be prescribed with syrup of phosphate of iron; if, however, it be combined with syrup of *pyrophosphate* of iron, the mixture becomes solid.

ACID. SULPH. DIL.—The rules which I have above given will obviate the necessity of enumerating the long list of substances with which this acid is incompatible. There is one combination, however, which I must warn you to avoid. Sulphuric acid is, as you are aware, very efficacious in cases of internal haemorrhage, and so are the lead salts; we may not, however, combine these agents, as an insoluble sulphate of lead would result.

ACID. NITRIC. DIL.—Dr. Paris writes that he has seen a formula in which “a tincture of opium was directed to be prepared with rectified spirit, and mixed with undiluted nitric acid! In this case it may very safely be inferred that its author was not only ignorant of the chemical habitudes of those bodies but that he was moreover guiltless of ever havi

perpetrated the act in question, or he would undoubtedly have found that, in consequence of the mutual action of these ingredients, *hyponitrous ether* is rapidly produced, and it is probable that the phial and its corrosive contents would have exploded, to the imminent hazard of the operator's eyes."

ACID. TANNIC. may be prescribed with the proto-salts of iron, but not with the persalts. Galls and tannic and gallic acids are said to be incompatible with infusions and decoctions containing alkaloids, but tannates of alkaloids are by no means inert; tannate of morphia will induce sleep, and tannate of emetine will cause vomiting. Tannic acid is also incompatible with gelatine, and with many metallic substances.

ACID. TARTARIC.—This acid was formerly much used in making saline draughts. Now, if bicarbonate of potash be added to a solution of tartaric acid, bitartrate of potash is thus formed, and at once precipitated; but if the tartaric acid be added to the salt of potash, no such untoward circumstance will occur.

ALUM is incompatible with alkalies and their carbonates, with tannic acid and preparations containing it, with tartrates, salts of lead, lime, and baryta, &c.

ANTIM. TART.—Acids, alkalies, and their carbonates, and some earthy and metallic preparations cause precipitates with tartar emetic, but these precipitates are soluble in excess of caustic alkalies. If tartar emetic be combined with astringent vegetable infusions an insoluble tannate of antimony will result. I may here mention that tartar emetic is often, and with perfect propriety, prescribed with sulphate of magnesia.

ARGENTI NITRAS.—It is almost unnecessary for me

to remind you that this salt should not be dissolved in undistilled water or in vegetable infusions.

ARGENTI OXIDUM.—This substance is incompatible with many organic substances. On account of its influence on the mucous membrane of the stomach, it might possibly occur to a practitioner that it would be a valuable addition to creasote in certain cases of vomiting. The result of such a combination would be spontaneous combustion.

FERRI ET AMMONIÆ CITRAS.—This salt is sometimes prescribed in effervescence. In such a case the iron salt must be put into the citric acid solution, and not into that of the bicarbonate of potash ; if the latter course were adopted, carbonic acid would be given off, with the probable effect of bursting the bottle. This salt is often prescribed with tincture of orange alone ; it will be well to remember that unless *some* water be added, it will be insoluble in this menstruum.

FERRUM TARTARATUM may be prescribed with alkaline carbonates.

HYDRARGYRI PERCHLORIDUM is incompatible with vegetable preparations containing albumen or tannin. It is precipitated by alkalies, alkaline sulphurets, iodides, tartar emetic, &c. ; in fact there is hardly anything with which it is advisable to combine corrosive sublimate except chloride of ammonium, which increases its solubility, and decoction of sarsaparilla.

HYDRARGYRI SUBCHLORIDUM.—You should be very careful not to order calomel in combination with any preparation containing a trace of prussic acid. Innoxious as calomel itself is, comparatively speaking, it is

converted by prussic acid into bichloride and bicyanide of mercury, two virulent poisons.

MAGNESIÆ SULPHAS.—I have seen a prescription in which Epsom salts was ordered with calcined magnesia and colchicum wine ; the result of such a combination would be an insoluble bulky mass.

PLUMBI ACETAS is incompatible with nearly everything except solid opium and distilled water. If common water be added to liquor plumbi subacetatis, carbonate and sulphate of lead will be thrown down.

POTASSII IODIDUM should not be prescribed with sweet spirits of nitre, acid preparations, or those containing starch. In fact, iodine and iodides should be prescribed with as few additions as possible. Iodide of potassium decomposes nearly all metallic salts.

CALUMBA.—When we desire to combine salts of iron with a vegetable tonic, calumba may be chosen, as it contains no tannic or gallic acid.

CAMPHORA forms soft masses with gum resins. It destroys the odour of musk.

CARYOPHYLLUM.—Cloves contain tannin, and hence should not be prescribed with iron salts.

TINCT. CASCARILLÆ.—This preparation is not unfrequently prescribed with dilute mineral acids : the combination is, however, objectionable, as floccules soon float through the mixture. If it is desirable to combine an acid with cascara, the infusion of that drug should be selected.

TINCT. CANNABIS INDICÆ.—If this or other spirituous solutions of resinous substances be added to water, the resin will be precipitated, unless mucilage be added in order to suspend it.

TINCT. GUAIACI.—I have already alluded to the fact that the addition of nitric ether to this preparation causes the formation of an unsightly bluish-green mass.

CHLOROFORM will not remain mixed with weak spirits or with glycerine.

BELLADONNA, HYOSCYAMUS, and STRAMONIUM.—It has long been known that caustic fixed alkalies decompose the alkaloids of these agents. Runge demonstrated the fact long ago, although a very recent author must have been ignorant of this, for he writes as if he claimed the discovery for himself. Carbonates and bicarbonates of the alkalies may be prescribed with preparations of these drugs.

OPIUM.—The older text-books contained a long list of substances which were supposed to be incompatible with opium; most of these are not now considered as improper combinations. Tincture of opium is not unfrequently prescribed with acetate of lead; a decomposition takes place resulting in the formation of acetate of morphia and insoluble meconate of lead.

QUINIAE SULPHAS is often prescribed in combination with infusion of roses, and a turbid and unsightly mixture results.

I will conclude the subject of incompatibility by reminding you that we are not always to infer, that because a substance is insoluble in water, it is necessarily therapeutically inactive. Such substances may oftentimes be so operated upon in the laboratory of the human economy as to become essentially active and potent.

LESSON VII.

POSOLOGY.

We have to-day to consider the extremely important subject of dosage. It is very necessary for you at the outset to understand that a medicine will exert a very different effect according to the dose administered; thus, tartar emetic in doses of from $1-16$ th to $1-6$ th of a grain acts as a diaphoretic; in doses of from $1-6$ th to $\frac{1}{2}$ a grain, when tolerance is established, it will act as a depressant; and in doses of from 1 to 2 grains it will produce emesis.

There is one matter of great interest and import connected with posology to which sufficient attention is not paid by the generality of practitioners—I allude to the modification of action exercised by a medicinal agent according as it is administered in one large dose or in several small doses at stated intervals. We have yet much to learn concerning this matter, and the subject opens up for you a wide field for original investigation. One of the most pungent writers in one of the most incisive articles which ever issued from his pen thus expresses himself: "No greater service could be performed by the colleges or the great medical societies than the formation of a committee of competent men for the special investigation of this question of dosage: for it is a subject which is as yet only in its infancy, and the best knowledge which exists about it is undoubtedly confined to a very small section of the medical profession."

I have recently published, for the use of students and practitioners, a Posological Chart, (a) in which I have endeavoured as far as possible to assist the memory and to facilitate reference. I purpose in this lesson to give you such a summary of the contents of this chart as will enable you to obtain and retain such a knowledge of official dosage as will be sufficient for the exigencies of ordinary practice. I use the term "official dosage" advisedly, for exception must be taken to many of the posological dicta of the British Pharmacopœia. For instance, the Pharmacopœia directs as a maximum dose of tincture of digitalis 30 minims, whereas, half an ounce is not unfrequently given in delirium tremens. A drachm is the maximum dose recommended for tincture of henbane, but half-an-ounce of that preparation is often given with benefit to maniacal patients. The minimum dose stated for tincture of belladonna is too large, and the maximum dose is too small. On the other hand, the maximum dose recommended for tincture of *nux vomica* would tetanise many a patient. A drachm is allotted as the maximum dose of *succus conii*, but I have myself seen an ounce of that preparation administered with great benefit. The Pharmacopœia specifies 5 grains as the extreme dose of sulphate of quinine, a dose which would be utterly useless in many cases of intermittent fever, &c. Again, the minimum dose recommended for strychnia and the salts of morphia is much too large.

(a) 'Posological Tables: being a Classification of the Doses of all Official Substances.' Third Edition. London: Baillière, Tindall, and Cox, King William Street, Strand.

Less than a year ago the late Dr. Anstie directed the attention of the profession to these defects in our "official dosage." (a) You will understand, therefore, that although in apportioning doses I have followed the British Pharmacopœia as an authority, I dissent in many instances from the recommendations in that volume. The doses which I am about to give are those for adults, so that I will ask your attention to the methods of Gaubius and Young for regulating doses according to age.

GAUBIUS' METHOD OF REGULATING DOSES ACCORDING TO AGE.

Ages.	Proportional Quantities.	Doses.
<i>For an Adult</i>	<i>suppose the dose to be 1 or 60 grains.</i>	
Under 1 year . .	will require . . . $\frac{1}{12}$	5 "
" 2 years . .	" . . . $\frac{1}{6}$	$7\frac{1}{2}$ "
" 3 " . .	" . . . $\frac{1}{4}$	10 "
" 4 " . .	" . . . $\frac{1}{3}$	15 "
" 7 " . .	" . . . $\frac{1}{2}$	20 "
" 14 " . .	" . . . $\frac{1}{12}$	30 "
" 20 " . .	" . . . $\frac{1}{6}$	40 "
Above 21 " . .	the full dose . . . —	60 "
" 65 " . .	the inverse gradation of the above	

YOUNG'S METHOD OF REGULATING DOSES ACCORDING TO AGE.

" For children under twelve the doses of most medicines must be diminished in the proportion of the age to the age increased by 12." Thus:—

YOUNG'S METHOD OF REGULATING DOSES ACCORDING TO AGE.

$$\text{For one year, } \frac{1}{1+12} = \frac{1}{13}$$

$$\text{For four years, } \frac{4}{4+12} = \frac{1}{4}$$

$$\text{For two years, } \frac{2}{2+12} = \frac{1}{7}$$

$$\text{For six years, } \frac{6}{6+12} = \frac{1}{3}$$

$$\text{For three years, } \frac{3}{3+12} = \frac{1}{5}$$

&c. &c.

Not only must *age* be taken into consideration in apportioning a dose, but *sex, habit, temperament, idiosyncrasy, disease, race, and climate* must all receive due consideration. It is unnecessary for me to do more than remind you that certain drugs, as opium, are very badly borne by children.

In the following posological summary I will adopt the classification which I have used in my chart.

INORGANIC SUBSTANCES.

METALLOIDS.

Carbo ligni	}	gr. xx.—3.
„ animalis pur.		
Sulphur sublimat.	}	gr. xx.—3.
„ præcipitat.		
„ iodidum	}	gr. $\frac{1}{2}$ —ij.
Phosphorus		
Iodium		gr. 1-40th—1-10th.

ACIDS.

Dilute acids, average dose m. v.—xx., *except acid. hydrocyanic. dil., the dose of which is mii.—viii., and acid. acetic. dil., the dose of which is m. v.—ii.*

The dose of acid. sulph. are that of the dilute acids.

The dose of acid. sulphurosum is mxxx.—3j.
The following are the doses of the *solid* acids :—

Acid. Arseniosum	gr. 1-6oth—1-12th.
„ Carbolic	gr. i.—iii.
„ Tannic	gr. ii.—x.
„ Gallic	gr. x.—xv.
„ Benzoic	gr. x.—xxx.
„ Citric	
„ Tartaric	

SALTS OF THE ALKALIES.

Ammonium.—Dose of all the salts is gr. v.—xx., except the carbonate, the dose of which, as a stimulant, is gr. iii.—x., and as an emetic, gr. xxx., well diluted.

Potassium.—The dose of sulphurated potash is gr. iii.—vi. ; that of iodide of potassium is gr. ii.—x. ; that of the bromide, carbonate, chlorate, and nitrate is gr. v.—xxx. ; that of the bicarbonate is gr. x.—xl. ; and that of the acetate, citrate, sulphate (*purgative*), tartrate, and acid tartrate is gr. xv.—3. The dose of either of the two latter salts when they are used as *purgatives* is 3ii—iv.

Sodium.—Arseniate, gr. 1-16th—1-8th ; valerianate, gr. i.—v. ; hypophosphite, gr. v.—x. ; dried carbonate, gr. iii.—x. ; carbonate, gr. v.—xxx. ; acetate, baborate, bicarbonate, and sulphite, gr. x.—3. ; effervescing citro-tartrate, 3i.—ii. ; tartarated soda, 3ii.—iv. ; and phosphate and sulphate, 3ii.—3.

Lithium.—Carbonate, gr. iii.—vi. ; citrate, gr. v.—x.

SALTS OF ALKALINE EARTHS.

Barium.—The dose of the chloride is usually given

in text-books as gr. $\frac{1}{2}$ —ii. ; this, however, is much too large a dose ; it should not be administered in doses exceeding gr. 1-16th—1-12th.

Calcium.—The dose of the hypophosphate of lime is gr. v.—x. ; that of the chloride and phosphate is gr. x.—xx. ; and that of the precipitated carbonate and of prepared chalk is gr. x.—3.

Magnesium.—The dose of magnesia and of carbonate of magnesia is gr. x.—3 ; that of the sulphate is 3i.—iv.

SALTS OF THE EARTHS.

Aluminum.—Alum as an *astringent* is given in doses of gr. x.—xx., and as a *purgative* gr. xxx.—3.

SALTS OF THE METALS PROPER.

Antimonium.—The dose of tartar emetic as a dia-phoretic is gr. 1-16th—1-6th ; as a depressant, gr. $\frac{1}{2}$ — $\frac{1}{4}$; and as an emetic, gr. i.—ii. The remaining preparations of antimony—viz., black antimony, oxide of antimony, and sulphurated antimony are all given in doses of gr. i.—iv.

Argentum.—Nitrate, gr. $\frac{1}{4}$ — $\frac{1}{2}$; oxide, gr. $\frac{1}{2}$ —ii.

Bismuthum.—Oxide, gr. v.—xv. ; carbonate and subnitrate both gr. v.—xx.

Cerium.—Oxalate, gr. i.—ii.

Cuprum.—Sulphate, gr. $\frac{1}{2}$ —ii., or, as an *emetic*, gr. v.—x.

Ferrum.—Arseniate, gr. 1-16th— $\frac{1}{2}$; dried sulphate, $\frac{1}{2}$ —iii. ; sulphate, granulated sulphate, reduced iron, and iodide of iron, all gr. i.—v. ; tartarated iron, phos-

phate, magnetic oxide, citrate of iron and quinine, citrate of iron and ammonia, all gr. v.—x. ; saccharated carbonate, gr. v.—xx. ; hydrated peroxide, gr. v.—xxx. and moist peroxide, 3ii.—iv.

Hydrargyrum.—Perchloride, gr. 1-16th—1-8th ; red iodide, gr. 1-16th— $\frac{1}{2}$; green iodide, gr. $\frac{1}{2}$ —iii. ; subchloride, gr. $\frac{1}{2}$ —v. ; hyd. c. cretâ, gr. iii.—viii.

Manganesum.—Sulphate as a purgative, 3i.—ii.

Plumbum.—Iodide, gr. $\frac{1}{2}$ —i. ; acetate, gr. i.—iv.

Zincum.—Chloride, gr. $\frac{1}{2}$ —i. ; acetate, as a tonic, gr. i.—ii. ; sulphate, as a tonic, and valerianate, gr. i.—iii. ; carbonate, gr. i.—v. ; oxide, gr. ii.—x. ; acetate, as an emetic, gr. x.—xx. ; sulphate, as an emetic, gr. x.—xxx.

ORGANIC SUBSTANCES.

VEGETABLE PRODUCTS.

Elaterium—*Sediment from juice of fruit.* gr. 1-16th— $\frac{1}{2}$.

Capsicum—*Fruit.*

Digitalis—*Leaf.*

Podophyllin—*Resin.*

Rhus Toxicodendron—*Leaf.*

gr. $\frac{1}{2}$ —i.

Ipecacuanha (expectorant)—*Root.*

Opium—*Inspissated juice of fruit.*

gr. $\frac{1}{2}$ —ii.

Cambogia—*Gum-resin.*

Nux Vomica—*Seeds.*

Scilla—*Corm.*

Veratrum Viride—*Rhizome.*

Stramonium—*Leaf.*

gr. i.—iii.

Aloes—*Inspissated juice of leaf.*

Jalapæ Resina.

gr. ii.—v.

<i>Eupulin</i> — <i>Powder of scales.</i>	gr. ii.—viii.
<i>Aconitum</i> — <i>Leaf.</i>	
<i>Colchicum</i> — <i>Corm.</i>	
<i>Colocynth</i> — <i>Pulp.</i>	
<i>Conium</i> — <i>Leaf.</i>	
<i>Piper</i> — <i>Berries.</i>	
<i>Sabina</i> — <i>Tops.</i>	
<i>Sagapenum</i> — <i>Gum-resin.</i>	
<i>Scammonium</i> — <i>Resin and gum-resin.</i>	
<i>Staphisagria</i> — <i>Seeds.</i>	
<i>Camphora</i> — <i>Concrete volatile oil.</i> gr. i.—x.	
<i>Myristica</i> — <i>Seeds.</i> gr. v.—xv.	
<i>Balsamum Peruvianum.</i> ℥v.—xv.	
<i>Ammoniacum</i> — <i>Gum-resin.</i>	gr. x.—xx.
<i>Assafœtida</i> — <i>Gum-resin.</i>	
<i>Benzoinum</i> — <i>Balsam.</i>	
<i>Calumba</i> — <i>Root.</i>	
<i>Cardamomum</i> — <i>Seeds.</i>	
<i>Caryophyllum</i> — <i>Flower-buds.</i>	
<i>Pimenta</i> — <i>Berries.</i>	
<i>Podophyllum</i> — <i>Root.</i>	
<i>Quassia</i> — <i>Shavings.</i>	
<i>Rheum</i> — <i>Root.</i>	
<i>Serpentaria</i> — <i>Root.</i>	
<i>Styrax Præparatus</i> — <i>Balsam.</i>	
<i>Tolutanum</i> — <i>Balsam.</i>	
<i>Canella</i> — <i>Bark.</i>	gr. x.—xxx.
<i>Cascarilla</i> — <i>Bark.</i>	
<i>Catechu</i> — <i>Extract of leaves.</i>	
<i>Cinnamomum</i> — <i>Bark.</i>	
<i>Coriandrum</i> — <i>Fruit.</i>	
<i>Ergota</i>	
<i>Galbanum</i> — <i>Gum-resin.</i>	
<i>Gentiana</i> — <i>Root.</i>	
<i>Guaiacum</i> — <i>Resin.</i>	
<i>Ipecacuanha (emetic)</i> — <i>Root.</i>	
<i>Jalapa</i> — <i>Root.</i>	
<i>Kino</i> — <i>Inspissated juice.</i>	
<i>Lactucarium</i> — <i>Inspissated juice.</i>	
<i>Myrrha</i> — <i>Gum-resin.</i>	
<i>Simaruba</i> — <i>Root-bark.</i>	
<i>Terebinthina Canadensis</i> — <i>Oleo-resin.</i>	
<i>Uva Ursi</i> — <i>Leaves.</i>	
<i>Valeriana</i> — <i>Root.</i>	
<i>Zingiber</i> — <i>Rhizome.</i>	

<i>Bucco</i> — <i>Leaves.</i>	gr. x.—xl.
<i>Cusparia</i> — <i>Bark.</i>	
<i>Mastiche</i> — <i>Resin.</i>	
<i>Ruta</i> — <i>Leaves.</i>	
<i>Absinthium</i> — <i>Flowering herb.</i>	
<i>Cinchona</i> — <i>Bark.</i>	gr. x.—3.
<i>Copaiba</i> — <i>Oleo-resin.</i>	
<i>Cortex Winteri</i> — <i>Bark.</i>	
<i>Krameria</i> — <i>Root.</i>	
<i>Matico</i> — <i>Leaves.</i>	gr. x.—3.
<i>Pareira</i> — <i>Root.</i>	
<i>Santonica</i> — <i>Flower-heads.</i>	
<i>Senega</i> — <i>Root.</i>	
<i>Sumbul</i> — <i>Root.</i>	gr. xxx.—3ii.
<i>Tormentilla</i> — <i>Rhizome.</i>	
<i>Cassia</i> — <i>Pulp.</i>	
<i>Crocus</i> — <i>Stigma.</i>	
<i>Cubeba</i> — <i>Fruit.</i>	gr. xxx.—3ii.
<i>Filix</i> — <i>Rhizome.</i>	
<i>Kamela</i> — <i>Powder of capsules.</i>	
<i>Senna</i> — <i>Leaves.</i>	
<i>Spigelia</i> — <i>Root.</i>	3ii.—iv.
<i>Cusso</i> — <i>Flowers and tops.</i>	
<i>Manna</i> — <i>Concrete exudation.</i>	
<i>Sinapis (emetic)</i> — <i>Seeds.</i>	
<i>Areca</i> — <i>Seed.</i> 3ss.— $\frac{3}{4}$.	gr. xx., up.
<i>Tragacantha</i> — <i>Gummy exudation.</i>	
<i>Acacia</i> — <i>Gummy exudation.</i> <i>Ad. lib.</i>	

Substances printed in italics in the foregoing list are not now officinal.

SALTS OF ORGANIC BASES, ALKALOIDS, AND OTHER ACTIVE PRINCIPLES.

Digitalinum. gr. 1-60th—1-30th.

Strychnia. gr. 1-30th—1-12th.

Veratria. gr. 1-12th—1-6th.

Morphiæ Acetas.

Morphiæ Hydrochloras.

Santoninum. gr. ii.—vi.

gr. $\frac{1}{2}$ — $\frac{1}{4}$.

Quiniæ Valerianas.	}	gr. i.—x.
Quiniæ Sulphas.		
Cinchoniæ Sulphas.		
Cinchoniæ Hydrochloras.		
Cinchonidinæ Sulphas.		
Beberiæ Sulphas.		

HYDROCARBONS AND ALCOHOLIC BODIES, ETC.

Chloral Hydras.	gr. v.—xxx.	}	3i.—ii.
Creasotum.	m <i>i</i> .—iii.		
Chloroformum.	m <i>iii</i> .—x.		
Æther.	m <i>xx</i> .—3 <i>i</i> .		
Æther Aceticus.	m <i>xx</i> .—3.		
Acetum.			
Glycerinum.			
Cerevisie Fermentum.	3 <i>iv</i> .—3.		
Amyl Nitris.	m <i>ii</i> .—v. <i>To be inhaled with caution.</i>		

ANIMAL PRODUCTS.

Castoreum.	}	gr. v.—x.
Fel Bovinum.		
Moschus.		
Pepsina.		
Pepsina Porci.		

PHARMACOPÆIAL GROUPS.

ACETA.

Acetum.	3 <i>i</i> .—ii.
Acetum Scillæ.	m <i>xv</i> .—x.

AQUÆ.

The dose of all the aquæ is 3*i*.—ii., except *Aqua Laurocerasi*, the dose of which is m*v*.—xxx.

CONFECTIONES.

The dose of all is 3*i*.—ii., except *Confectio Opii*, which is gr. v.—xx., and *Confectio Scammonii*, which is gr. x.—xxx.

DECOCTA.

The dose of all is $\frac{3}{4}$ i.—ii. except—

D. Scoparii.	}	$\frac{3}{4}$ ii.—iv.
D. Taraxaci.		
D. Ulmi.		
D. Sarsæ Compositum.	}	$\frac{3}{4}$ ii.—x.
D. Sarsæ.		
D. Hordei, <i>ad lib.</i>		

ESSENTIÆ.

The dose of both the essences is $\frac{1}{2}$ x.—xv.

EXTRACTA.

The dose of all the *liquid* extracts is $\frac{1}{2}$ x.—xxx., except—

E. Glycyrrhizæ L.	$\frac{3}{4}$ i.	}	$\frac{1}{2}$ xxx.— $\frac{3}{4}$ ii.
E. Belæ L.			
E. Pareiræ L.			
E. Sarsæ L.	$\frac{3}{4}$ ii.—iv.		

The following are the doses of the *solid* extracts:—

E. Physostigmatis.	gr. 1-16th— $\frac{1}{4}$.	}	gr. $\frac{1}{4}$ —i.
E. Stramonii.	gr. $\frac{1}{4}$ — $\frac{1}{2}$.		
E. Cannabis Indicæ.			
E. Belladonnæ.			
E. Aconiti.		}	gr. $\frac{1}{2}$ —ii.
E. Colchici.			
E. Colchici Aceticum.			
E. Nucis Vomicæ.			
E. Opii.		}	gr. ii.—v.
E. Aloes.			
E. Conii.			
E. Papaveris.			
E. Quassiae.		}	$\frac{1}{2}$
E. Anthemidis.			
E. Calumbæ.			
E. Colocynthidis Compositum.			
E. Gentianæ.			
E. Hyoscyami.			

E. Jalapæ.	}	gr. v.—xv.
E. Lactuæ.		
E. Lupuli.		
E. Rhei.		
E. Glycyrrhizæ.	}	gr. x.—xx.
E. Hæmatoxyl.		
E. Krameriæ.		
E. Pareiræ.		
E. Taraxaci.		

INFUSA.

The dose of all is $\frac{3}{4}$ i.—ii., except—

I. Digitalis, $\frac{3}{4}$ ii.—iv.	}	$\frac{3}{4}$ i.—iv.
I. Anthemidis.		
I. Buchu.		
I. Caryophylli.		
I. Maticæ.		
I. Cusso, $\frac{3}{4}$ iv.—viii.		

LIQUORES.

The dose of the majority of the liquors is $\frac{1}{2}$ v.—xxx.
The following are the exceptions:—

L. Ammoniæ Fort.	}	$\frac{1}{2}$ ii.—viii.
L. Arsenicalis.		
L. Arsenici Hydrochloricus.		
L. Sodaæ Arseniatis.		
L. Strychniæ.		
L. Chlori.	}	$\frac{1}{2}$ v.—xx.
L. Sodaæ Chloratae.		
L. Hydrargyri Perchloridi. $\frac{1}{2}$ xxx.— $\frac{3}{4}$ ii.		
L. Potassæ Permanganatis. $\frac{3}{4}$ i.—iv.		
L. Ammoniæ Acetatis.		
L. Ammoniæ Citratis.	}	$\frac{3}{4}$ ii.—vi.
L. Magnesiæ Carbonatis. $\frac{3}{4}$ i.—ii.		
L. Magnesiæ Citratis. $\frac{3}{4}$ v.—x.		
L. Calcis. $\frac{3}{4}$ i.—iv.		
L. Lithiæ Effervescens.		
L. Potassæ Effervescens.	}	$\frac{3}{4}$ v.—x.
L. Sodaæ Effervescens.		

MISTURÆ.

The dose of all is $\frac{3}{2}$ i.—ii., except—

M. Ammoniaci.	$\left. \begin{array}{l} \\ \\ \end{array} \right\}$	$\frac{3}{4}$ iv.— $\frac{3}{2}$ i.
M. Gentianæ.		
M. Sennæ Co. $\frac{3}{2}$ i.— $\frac{3}{2}$ xii.		

OLEA.

The dose of all is $\frac{1}{2}$ i.—v., except—

O. Crotonis. $\frac{1}{2}$ i.—i.	$\left. \begin{array}{l} \\ \\ \\ \\ \\ \\ \\ \\ \end{array} \right\}$	$\frac{1}{2}$ v.—xx.
O. Phosphoratum. $\frac{1}{2}$ v.—x.		
O. Copaiæ.		
O. Cubeæ.		
O. Terebinthinæ (<i>Stimulant & Diuretic</i>). $\frac{1}{2}$ i.—iv.		
O. Amygdalæ, $\frac{3}{2}$ i.—iv.		
O. Terebinthinæ (<i>Anthelmintic</i>), $\frac{3}{2}$ i.—vi.		
O. Morrhuæ.		
O. Olivæ.		

O. Ricini.	$\left. \begin{array}{l} \\ \end{array} \right\}$	$\frac{3}{2}$ i.— $\frac{3}{2}$ i.
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The dose of *Oxymel* is $\frac{3}{2}$ i.—ii.; and of *Oxymel Scillaæ* is $\frac{1}{2}$ xxx.— $\frac{3}{2}$ i.

PILULÆ.

Dose of all is gr. v.—x., except—

P. Phosphori.	$\left. \begin{array}{l} \\ \\ \end{array} \right\}$	gr. iii.—v.
P. Plumbi cum Opio.		
P. Saponis Composita.		
P. Ferri Iodidi.	$\left. \begin{array}{l} \\ \\ \end{array} \right\}$	gr. iii.—viii.
P. Hydrargyri.		
P. Ferri Carbonatis. gr. v.—xx.		

PULVERES.

The following are the doses of the powders:—

P. Elaterii Co. gr. $\frac{1}{2}$ —v.	$\left. \begin{array}{l} \\ \\ \\ \\ \\ \end{array} \right\}$	gr. v.—xx.
P. Opii Compositus. gr. ii.—v.		
P. Antimonalis. gr. iii.—x.		
P. Ipecacuanhæ Compositus. gr. v.—xv.		
P. Kino Compositus.		
P. Scammonii Compositus.		

P. Cretæ Aromaticus cum Opio.	gr. x.—xl.
P. Aromaticus.	
P. Catechu Compositus.	
P. Cretæ Aromaticus.	gr. x.—3i.
P. Glycyrrhizæ Compositus.	
P. Jalapæ Compositus.	
P. Rhei Compositus.	
P. Tragacanthæ Compositus.	
P. Amygdalæ Compositus. 3i.—ii.	

SPIRITUS.

The dose of all spirits is m_{xx} .—3i., with the following exceptions :—

S. Camphoræ. m_x .—xxx.	m_{xxx} .—3ii.
S. Ætheris.	
S. Ætheris Nitrosi.	
S. Armoraciæ Compositus.	

SUCCI.

The doses of these are as follows :—

S. Belladonnæ. m_v .—xv.	3i.—ii.
S. Conii. m_{xxx} .—3i.	
S. Hyoscyami. 3ss.—3i.	
S. Scoparii.	
S. Taraxaci.	
S. Limonis. 3i.—iv.	
S. Mori. <i>ad lib.</i>	

SYRUPI.

The dose of all is about 3i., except—

S. Ferri Iodidi.	m_{xxx} .—3i.
S. Scillæ.	
S. Chloral. m_{xxx} .—3ii.	
S. Rhei.	3i.—iv.
S. Sennæ.	

TINCTURÆ.

The tinctures may thus be grouped, according to their dosage :—

T. Aconiti ; T. Belladonnæ ; T. Cannabis Indicæ ; T. Cantharidis ; T. Capsici ; T. Iodi ; T. Nucis Vomicæ ; T. Veratri Viridis ; T. Zingiberis Fortior.

All m_v .—xx.

T. Colchici Seminum ; T. Digitalis ; T. Ferri Acetatis ; T. Ferri Perchloridi ; T. Laricis ; T. Lobeliae ; T. Lobeliae Ætherea ; T. Opii ; T. Scillæ ; T. Stramonii ; T. Sumbul ; T. Tolutana.

All m_v .—xxx.

T. Assafœtidæ ; T. Benzoini Composita ; T. Camphoræ Composita ; T. Castorei ; T. Chloroformi Composita ; T. Croci ; T. Guaiaci Ammoniata ; T. Hyoscyami ; T. Myrrhæ ; T. Opii Ammoniata ; T. Sabinæ ; T. Valerianæ Ammoniata ; T. Zingiberis.

All m_v .— z_i .

T. Aloes ; T. Arnicæ ; T. Aurantii ; T. Aurant Recent. ; T. Buchu ; T. Calumbæ ; T. Cardamomi Composita ; T. Cascariæ ; T. Catechu ; T. Chiratae ; T. Cinchonæ Composita ; T. Cinchonæ Flavæ ; T. Cinnamomi ; T. Conii ; T. Cubebæ ; T. Ergotæ ; T. Gallæ ; T. Gentianæ Composita ; T. Jalapæ ; T. Kino ; T. Krameriaæ ; T. Lavandulæ Composita ; T. Limonis ; T. Lupuli ; T. Quassiae ; T. Quiniæ ; T. Quiniæ Ammon. ; T. Senegæ ; T. Serpentariaæ ; T. Valerianæ.

All m_{xxx} .— z_{ii} .

T. Sennæ. z_i .—iv.

T. Rhei (*Purgative*). z_{iv} .— z_i .

TROCHISCI.

From one to six of any of the lozenges may be given, except lozenges of ipecacuanha, of which not more than three should be administered.

VINA.

The following are the doses of the wines :—

V. Colchici.

V. Ipecacuanhæ (*Expectorant*).

V. Opii.

$\left. \begin{array}{l} \\ \\ \end{array} \right\}$ m_x .—xxx.

V. Aloes.	} 3i.—ii.
V. Rhei.	
V. Ferri.	} 3i.—iv.
V. Ferri Citratis.	
V. Ipecacuanhæ (<i>Emetic</i>). 3iii.—3vi.	} 3iv.—3i.
V. Antimonialis (<i>Emetic</i>).	
V. Quiniæ.	

In the foregoing summary I have included those substances which are contained in the recent "Additions" to the *Pharmacopœia*. I will not now speak of *accumulation* and *toleration* of drugs, as I have elsewhere treated in detail of these important subjects.

The following quotation from an able article in the 'Medico-Chirurgical Review,' will form a fit conclusion to the present Lesson: "Doses are the most relative things in the world. It must be confessed that a certain maturity of mind and boldness of action are requisite to escape from the slavery of posological entities and essences, and to allow the apparent exigencies of the case before us to be our sole guide. That constitutional bashfulness which is called 'caution,' which habitually delights in small ways, and which is half afraid of the instruments it uses, should practise other arts than the art of medicine. A wise courage is the physician's watchword."

LESSON VIII.

VARIETIES OF MAGISTRAL FORMULÆ.

In the construction of extemporaneous formulæ I can suggest to you no better models than the *Officinal*:

Preparations ; and I have to assure you that a careful study of the *principles* which have guided the compilers of the Pharmacopœia cannot fail to render you the greatest assistance. In connection with this subject I would refer you to my recently published ' Notes on the Pharmacopœial Preparations.'

MIXTURES.

Mixtures are generally extemporaneous compounds in which fluid ingredients are mixed or hold solid substances dissolved or suspended, and which are intended for internal use in divided doses.

The knowledge of incompatibility, which we have already acquired in a former Lesson, will prevent us from mixing substances which chemically unite with, or decompose, each other. At times, as I have already stated, we *designedly* prescribe a combination which will result in a definite chemical decomposition, but such cases are exceptional.

Certain substances which are insoluble, or nearly so, may nevertheless be prescribed in the fluid form, for internal or external use, with perfect propriety under certain conditions ; thus, some insoluble salts may be *diffused by agitation* as magnesia, phosphate of lime, sulphate of quinine, &c. ; other substances may be *mixed by trituration*, as various extracts, confections, and gum-resins ; others, again, may be *suspended by the aid of excipients*, as oils, copaiba, &c.

The table on pages 52 and 53 showing the solubility of salts can hardly fail, I think, to be appreciated by the young prescriber. I constructed it to supply a want

which I myself frequently experienced in my younger days. I may mention that a much more comprehensive table than this may be found in Gray's 'Supplement to the Pharmacopoeia,' but the following is sufficient for the ordinary wants of the prescriber.

The term "Emulsion" is properly applied to a mixture of a milky appearance formed by the mechanical union of oily or resinous ingredients with an aqueous fluid by means of an "excipient" which possesses the property of combining with both.

The Excipients in most common use are:—1. *Water*, which forms an emulsion with gum-resins. 2. *Mucilage of gum-acacia*, used for emulsifying oils, resins, and copaiba, &c. 3. *Mucilage of gum-tragacanth*. 4. *Syrups*. 5. *Confections*. 6. *Extracts*. 7. *Yolk of egg*. 8. *Milk* for suspending scammony, as in the officinal mixture of that resin. 9. *Almond mixture*. 10. *Liquor Potassæ* for copaiba and fixed oils.

Not unfrequently it is desirable to add a volatile oil to a mixture, and this may be done by mixing the oil in the first instance with syrup, or by rubbing it up with sugar. It may be well to remember that volatile oils should always be prescribed with some fixed oil if an emulsion is intended. Other points which I would have you bear in mind with regard to emulsions are these: that, as a rule, *soluble salts should not be prescribed with oleaginous emulsions*; *spirits should not be prescribed with those which are made with yolk of egg or mucilage*; and *acids are incompatible with mixtures emulsified by an alkali*.

Mixtures should not be too thick; one fluid ounce should hold only 3js of a vegetable powder, 2ii of an

TABLE OF SOLUBILITY.

In Water.	In Alcohol.
Soluble.	Insoluble.
Acid. Aereniosum— $\frac{1}{2}$ in <i>too cold</i> 1 in <i>20 boiling</i>	Ammonia Benz.
Alumen.— $\frac{1}{2}$ in <i>12 cold</i> , 10 in <i>8 boiling</i>	Carb.— <i>sparingly</i> " Nit.— <i>sparingly in rect.</i> spirit.
Benzos.— $\frac{1}{2}$ in 5	" Sulphurat.
Bromid.— $\frac{1}{2}$ in 11	Argent. Oxid.
Carb.— $\frac{1}{2}$ in 4	Bismuth. Carb.
Chlorid.— $\frac{1}{2}$ in 3	Oxid.
Nitras—in <i>less than its own weight</i>	" Subnit.
Phosph.— $\frac{1}{2}$ in 2	Calcis Phosph.
uri.— $\frac{1}{2}$ in <i>20 cold</i>	Cerii Oxalas
Nit.— <i>in half its weight at 1</i>	Creta Prep.
<i>F.</i>	Ferri Arsenias
<i>Chlorid.</i>	Carb. Sacch.
Calciu Iodid.	Oxid. Mag.
Calciu Chlorid.— <i>in twice its weight</i>	Perox. Hydrat.
Calces Hypophosphis— $\frac{1}{2}$ in 6	" Phosph.
Calcs.— <i>A pint of water at 60° F. dissolves nearly 32 grains. It is</i> <i>less soluble in boiling water.</i>	Hydrg. Ammon.
<i>Ca</i> [sic] <i>Ulorata</i> — <i>partially soluble</i>	Iodid. Rub.
Cupri Sulph.— $\frac{1}{2}$ in 3	Iodid. Vir.
Ferrid et Ammon. Cit.—10 in 5	Oxid. Flav.
" et Quinua Cit.—2 in 1	Rub.
Iodid.—1 in 1	Subchlor.
" Sulph.— $\frac{1}{2}$ in 14	Sulphuretum
Ferrum Tart.—1 in 4	Magnesia Carb.
Hydrg. Perchlor.—1 in 15	Magnesia Carb.
Acid. Aereniosum— $\frac{1}{2}$ in <i>too cold</i> 1 in <i>20 boiling</i>	Alumen. Phosph.— <i>th-</i> <i>soluble in rectified</i> <i>spirit.</i>
Alumen.— $\frac{1}{2}$ in <i>12 cold</i> , 10 in <i>8 boiling</i>	Ammon. Phosph.— <i>th-</i> <i>soluble in rectified</i> <i>spirit.</i>
Benzos.— $\frac{1}{2}$ in 5	Antim. Tart.— <i>insoluble</i> <i>in absolute alcohol</i>
Bromid.— $\frac{1}{2}$ in 11	Argent. Nit.— <i>insoluble</i> <i>in alcohol, soluble in</i> <i>rectified spirit</i>
Carb.— $\frac{1}{2}$ in 4	Calcis Hypophosph.— <i>insoluble in rectified</i> <i>spirit.</i>
Chlorid.— $\frac{1}{2}$ in 3	Ferr et Ammon. Cit.
Nitras—in <i>less than its own weight</i>	" et Quinua Cit.
Phosph.— $\frac{1}{2}$ in 2	" Sulph.
uri.— $\frac{1}{2}$ in <i>20 cold</i>	Hydrg. Ammon.— <i>in-</i> <i>soluble also in ether</i>
Nit.— <i>in half its weight at 1</i>	Hydrg. Sulphuretum
<i>F.</i>	" Subchlor.— <i>in-</i> <i>soluble also in ether</i>
<i>Chlorid.</i>	Lithia Carb.
Calciu Iodid.	Potasse Bicarb.
Calciu Chlorid.— <i>in twice its weight</i>	" Carb.
Calces Hypophosphis— $\frac{1}{2}$ in 6	" Cit.
Calcs.— <i>A pint of water at 60° F. dissolves nearly 32 grains. It is</i> <i>less soluble in boiling water.</i>	" Sulph.
<i>Ca</i> [sic] <i>Ulorata</i> — <i>partially soluble</i>	" Tart.
Cupri Sulph.— $\frac{1}{2}$ in 3	
Ferrid et Ammon. Cit.—10 in 5	
" et Quinua Cit.—2 in 1	
Iodid.—1 in 1	
" Sulph.— $\frac{1}{2}$ in 14	
Ferrum Tart.—1 in 4	
Hydrg. Perchlor.—1 in 15	
Acid. Aereniosum— $\frac{1}{2}$ in <i>too cold</i> 1 in <i>20 boiling</i>	Magnesia— <i>almost</i>
Alumen.— $\frac{1}{2}$ in <i>12 cold</i> , 10 in <i>8 boiling</i>	<i>More soluble in cold</i> <i>than in hot water</i>
Benzos.— $\frac{1}{2}$ in 5	Sodii Chlorid.— <i>not soluble in also-</i> <i>rectified alcohol</i>
Bromid.— $\frac{1}{2}$ in 11	
Carb.— $\frac{1}{2}$ in 4	
Chlorid.— $\frac{1}{2}$ in 3	
Nitras—in <i>less than its own weight</i>	
Phosph.— $\frac{1}{2}$ in 2	
uri.— $\frac{1}{2}$ in <i>20 cold</i>	
Nit.— <i>in half its weight at 1</i>	
<i>F.</i>	
<i>Chlorid.</i>	
Calciu Iodid.	
Calciu Chlorid.— <i>in twice its weight</i>	
Calces Hypophosphis— $\frac{1}{2}$ in 6	
Calcs.— <i>A pint of water at 60° F. dissolves nearly 32 grains. It is</i> <i>less soluble in boiling water.</i>	
<i>Ca</i> [sic] <i>Ulorata</i> — <i>partially soluble</i>	
Cupri Sulph.— $\frac{1}{2}$ in 3	
Ferrid et Ammon. Cit.—10 in 5	
" et Quinua Cit.—2 in 1	
Iodid.—1 in 1	
" Sulph.— $\frac{1}{2}$ in 14	
Ferrum Tart.—1 in 4	
Hydrg. Perchlor.—1 in 15	

TABLE OF SOLUBILITY.

In Water.	In Alcohol.
Soluble.	Insoluble.
Acid. Arseniosum.—1 in 100 cold 1 in 20 boiling	Antim. Oxid. " Sulphurat.
Alumen.—1 in 12 cold, 10 in 8 boiling	" Argent. Oxid.
Ammon. Benzoas.—1 in 5	Bismuth. Carb.
Bromid.—1 in 14	" Oxid.
" Carb.—1 in 4	" Subnit.
" Chlorid.—1 in 3	Calcis Phosph.
" Nitras—in less than its own weight	Cerii Oxalas
" Phosph.—1 in 2	Creta Prep.
Antim. Tart.—1 in 20 cold 1 in 2 boiling	Ferri Arsenias
Argent. Nit.—in half its weight at 60° F.	" Carb. Saccch.
Bar Chord.	" Oxid. Mag.
	" Perox. Humid.
	" Tinct. Dragee.
	Alumen.
	Ammon. Phosph. — <i>insoluble in rectified spirit.</i>
	Antim. Tart.— <i>insoluble in absolute alcohol</i>
	Argent. Nit.— <i>insoluble in alcohol, soluble in rectified spirit</i>
	Calcis Hypophosph.— <i>insoluble in rectified spirit.</i>
	Ferri Arsen. Cr.
	" Quinic Cr.

1. *o* *o* *o* *o*
2. *o* *o* *o* *o*

3. *o* *o* *o* *o*
4. *o* *o* *o* *o*
5. *o* *o* *o* *o*
6. *o* *o* *o* *o*
7. *o* *o* *o* *o*
8. *o* *o* *o* *o*

9. *o* *o* *o* *o*
10. *o* *o* *o* *o*

11. *o* *o* *o* *o*
12. *o* *o* *o* *o*
13. *o* *o* *o* *o*
14. *o* *o* *o* *o*
15. *o* *o* *o* *o*

electuary or conserve, and 9i of an extract. It is almost unnecessary for me to say that heavy insoluble powders, or those which are not mechanically diffusible should never be prescribed in mixture.

We should always endeavour to administer our medicines in a form agreeable to the taste of the patient ; for this purpose *flavouring agents* are very generally added to mixtures and draughts, &c. The following are those in most frequent use :—Tincture of cinnamon, tincture of cardamoms, tincture of fresh orange-peel, spirit of lavender, syrup of orange, syrup of lemon, syrup of ginger. Some flavouring agents which are very extensively prescribed require the addition of viscid excipients ; such are oil of caraway, oil of cinnamon, oil of cloves, tincture of tolu, spirit of nutmeg and others.

The diluents most frequently employed in fluid preparations for internal use are :—Distilled water, medicated waters, infusions, and decoctions, &c. Nothing looks so bad, and is so likely to create misgivings in the mind of a patient, as to receive a bottle of medicine incompletely filled. It will be well, therefore, for the prescriber always to order such a quantity of a fluid remedy, whether for internal or external use, as will accurately fill one of the bottles of generally-recognized capacity. For instance, we might order two, three, four, six, or eight ounces of a mixture, not five or seven ounces.

DRAUGHTS.

A “draught” is an extemporaneous fluid preparation which differs from a mixture in containing a single.

dose. They are usually dispensed in phials holding an ounce and a half or two ounces.

Draughts possess the advantages of convenience, and are preferable to mixtures for the administration of medicines which would be liable to suffer by repeated removal of the cork.

POWDERS.

Powders are either simple or compound.

Insoluble substances, substances which would be chemically incompatible in the fluid form, and certain pulverizable extracts, are suited to this mode of administration. Some substances should never be prescribed in the form of powder, such are—those which have an extremely nauseous taste and odour; deliquescent, efflorescent and very volatile substances; substances requiring administration in large doses, and substances which liquify on mixing. The prescriber should carefully bear in mind that active substances, the dose of which is very small, should always be “diluted,” so to speak, with some inert powder, such as starch, gum, liquorice-root, sugar of milk, &c. The addition of an inert powder is often useful for its dividing or comminuting properties; it is with this object that sulphate of potash is added to the compound powder of ipecacuanha, and cream of tartar is added to the compound powder of jalap.

Some substances cannot be pulverized without the addition of other bodies; thus myrrh, gamboge, &c., require sugar or hard gum: some gum-resins, as assafoetida and scammony, require the addition of a of almond oil, while camphor and hard con-

extract of colocynth are best pulverized if slightly moistened with a drop of spirit.

It is very necessary for the prescriber to be aware that certain dry saline substances become moist on trituration with each other. This is the case when sulphate of soda is rubbed up with carbonate of potash, and when acetate of lead is mixed with sulphate of zinc.

The following salts are DELIQUESCENT.

Ammon. Nit.	Pot. Carb.
Calcii Chlorid.	„ Cit.
Lithiae Cit.	„ Sulphurata
Pot. Caust.	„ Tart.
„ Acet.	Zinci Chlorid.

Phosphate of Ammonia and Carbonate, Phosphate and Sulphate of Soda are EFFLORESCENT salts. Alum, Borax, Sulphate of Copper, Sulphate of Zinc, and Tartar Emetic are also slightly efflorescent, but not in such a degree as to preclude their administration in the form of powder.

Powders are generally prescribed in paper (chartulas), each containing a dose.

PILLS.

Pills are little globular masses of semi-solid consistence, composed of various medicinal agents, and intended to be swallowed whole. The following substances are suited to this form of administration :—

1. Substances acting in small doses, as metallic salts.
2. Substances intended to act slowly, usually, as alteratives.

3. Substances not intended to act until they reach the lower bowel.

4. Substances too readily soluble in the stomach when otherwise administered.

5. Substances too heavy for suspension in fluids.

6. Foetid substances.

7. Vegetable extracts, gum-resins, balsams, &c.

The following substances are unsuitable for administration in pill:—

1. Substances requiring large doses.

2. Deliquescent substances (unless intended for immediate use), and efflorescent substances (unless deprived of their water of crystallization).

3. Bodies of such consistency as to require much dry powder, or viscid material, to render them tenacious, as oils, except such as have a very small dose, e.g. croton oil.

4. Volatile substances.

5. Those intended to act immediately as emetics.

6. Essential oils in quantity exceeding half-a-drop to each pill.

In prescribing a pill-mass an excipient should be selected, the nature of which is suited to the active ingredients: solids require a soft or liquid excipient, and soft or liquid substances require an inert powder.

The following are the excipients most frequently employed:—

1. *Oil.* Volatile oils, unless rich in resinous ingredients, will not hold the mass well together.

2. *Mucilage*, adapted for powders. Pills made with mucilage are suited only for immediate use, as they become hard and difficult of solution in the stomach.

Mucilage should not be prescribed with salts of lead.

3. *Crumb of bread* should not be prescribed with nitrate of silver until the chloride of sodium which it contains be removed.

4. *Vegetable extracts*, available as excipients for powders.

5. *Confection of roses*. Adapted for heavy powders. The confection of red roses contains tannin, and hence should not be prescribed with substances with which tannin is incompatible. This confection is also incompatible with sulphurated antimony.

6. *Soap*. Well adapted for fatty substances, and for resinous bodies, the solubility of which it increases. Camphor may be very well combined with soap and honey. Soap should not be used for substances which are decomposed by alkalies ; it is consequently incompatible with tartar emetic.

7. *Honey, syrup, treacle*. Suitable as excipients for powders. They should not be prescribed with substances which are liable to be reduced by the presence of sugar, as calomel.

Honey combined with tragacanth forms a useful adhesive excipient ; and twenty grains of gum tragacanth, with an ounce of *glycerine*, also forms an excellent mass.

8. *Alcohol* is sometimes employed to give the requisite consistence to gums, gum-resins, camphor, compound extract of colocynth, &c.

9. *Inert powders*, as liquorice and starch, are used to give adhesiveness to soft extracts, &c. Some substances, as certain vegetable extracts, do not require

the addition of any excipient. I may mention that manna is occasionally used, and that it is particularly adapted as an excipient for reduced iron.

Some substances liquify when mixed. Thus it would be impossible to form a pill-mass with camphor and copaiba, unless we add some such substance as yolk of egg.

Copaiba may be readily made into a pill-mass by rubbing it up with freshly-calcined magnesia, in the proportion of two troy ounces to one drachm of the latter.

The prescriber should carefully bear in mind that a pill composed chiefly of vegetable matter *should not exceed five grains* in weight, but a pill, the principal bulk of which is made up of metallic substances, may weigh six, or even eight grains.

Pills are sometimes covered with gold or silver leaf, gelatine, collodion, sugar, albumen, &c., to prevent taste, and to give them a nice appearance. Pills containing mercury, free iodine, or sulphur, should not be covered with gold or silver leaf.

Pills should never be administered to young children.

A *bolus* is similar to but larger than a pill; it is a form of medicine not much used at the present day.

CONFETIONS, CONSERVES, AND ELECTUARIES.

These preparations are of the consistency of paste, and are made by mixing up substances with sugar, syrup, or honey. Properly speaking, the object of the sugar in confections and conserves is to act as a preservative, while in electuaries it is merely employed to

confer consistency. Mucilage is objectionable as an excipient, as an electuary made with it soon becomes hard.

These preparations should be sufficiently solid to prevent a separation of the ingredients, and yet so soft that they can be easily swallowed without mastication, thus: *dry vegetable powders* require the addition of twice their weight of syrup or honey; *gummy or resinous powders* require an equal weight; while *metallic powders* are best made up with a conserve.

Nauseous or deliquescent substances, or those which do not unite intimately with syrup, such as oils, balsams, &c., should not be prescribed in this form.

LOZENGES, OR TROCHES.

Small medicated cakes, intended to dissolve slowly in the mouth. They are made into a mass with sugar and some glutinous material, and dried without the aid of heat. Mucilage of gum-arabic, or of gum-tragacanth, thin isinglass, size or strained white of egg, are the excipients most frequently used. This form of administration is adapted for medicines which have not a disagreeable taste, or the taste of which can be covered or modified.

As a rule, they should weigh from 8 to 10 grains. A study of the *rationale* for preparing the Officinal Trochisci will be of service to the prescriber.

INHALATIONS—VAPOURS.

Those are medicines in the form of gases or vapours intended to be inhaled so as to act on the air-passages

and respiratory organs. Examples of the mode of prescribing them will be given in future Lessons.

GARGLES.

Liquid medicines for application to the back part of the mouth or upper part of the throat. The only special direction which I consider necessary at present to inculcate with regard to them is, that as they are sometimes liable to be swallowed owing to accident or negligence, they should not contain substances which would cause unpleasant or untoward symptoms.

INJECTIONS.

Liquid medicines intended to be thrown into a cavity of the body by means of a syringe.

ENEMAS, OR CLYSTERS.

Liquid medicines intended to be thrown into the rectum. They are usually made of a mucilaginous excipient, to which medicinal agents are added. Water is the best vehicle for astringent vegetable matter, metallic salts, or mineral acids. Oleaginous or resinous substances should be emulsified.

An enema should be warm, and its bulk should be proportioned to the effect which we desire to produce. The bulk should be large if we aim at purgation, but if our object is to produce a local effect, or to act on the system, the bulk should be small. The proper quantity for an infant one month old is one fluid ounce; that for a child a year old is two-and-a-half ounces; for a child from one to seven years - three or four ounces; for a child from seven

years old, six to seven ounces ; and for a patient aged from twelve years upwards the quantity should be half-a-pint or more. The dose of active ingredients should be three or four times greater than if administered by the mouth, as the rectum is less susceptible ; but this remark does not apply so forcibly to the administration of narcotics.

An enema is of great use when we desire to evacuate the bowel speedily, in cases where we cannot administer a purgative by the mouth. Enemas are also indicated in cases requiring direct medication of the lower bowel, as in dysentery, &c., or in disease of the bowel, and for the dislodgment of ascarides. Anodyne enemas are of great service in the treatment of irritation of the rectum, or of the neighbouring organs, as bladder or uterus. Nutritious enemas are given to sustain life when the patient is unable to swallow.

SUPPOSITORIES.

Medicines intended to be placed in the rectum in order to produce a local action, or to act on the system. They are usually cone-shaped masses, having the active agent incorporated with some substance capable of retaining the proper shape, as soap, spermaceti, cerate or cocoa-butter. The latter is too soft of itself, but this defect is remedied by the addition of an eighth part of wax.

EYE-WASHES.

Collyria or eye-washes are generally composed of solutions of astringent salts, as sulphate or acetate of zinc, sulphate of copper, sulphate of iron, nitrate of

silver. The strength of the solution seldom exceeds eight grains to the ounce. Wine of opium is a very frequent addition to collyria.

CATAPLASMS, OR POULTICES.

External applications generally employed to promote suppuration, to allay pain and inflammation, and to resolve tumours, &c. They should be soft, moist, not too heavy or too bulky, and should be sufficiently tenacious to accommodate themselves to the parts to which they are applied. The addition of a little lard, olive-oil, or glycerine, is very useful to prevent hardening, and to promote the emollient action. For further particulars regarding the construction of cataplasms I will refer you to my 'Notes on the Pharmacopœia.'

PLASTERS.

External applications, spread on leather, linen, or silk, which become soft and adherent at the temperature of the body.

They are chiefly composed of fatty substances, combined with metallic oxides, powders, wax, or resin. They owe their consistency either to—

1. Chemical combination of oxide of lead, with a fatty acid.
2. Admixture of fat or wax and resin.
3. Chemical action of the ingredients on each other, as in Emp. Ammoniaci.

LINIMENTS.

Semi-fluid ointments, or soapy applications, generally administered by friction with the hand.

An "Embrocation" is a preparation of a thinner consistence.

LOTIONS.

External applications or washes, generally consisting of simple solutions of medicinal substances, and usually applied by wetting a piece of linen.

OINTMENTS.

Soft unctious substances applied to the skin by inunction. They should have the consistency of good butter. Where the active ingredients are pulverulent, fresh lard free from salt is the best excipient. Fluid or semi-fluid ingredients require suet, or a mixture of suet and lard, or sometimes wax. On the other hand, if the ingredients form too dense a mass, oil may be added. A good vehicle for active ingredients is simple ointment.

"Cerates," so called from containing wax, are of a firmer consistence than ointments.

FUMIGATIONS.

Vapours or gases extemporaneously set free for deodorizing or disinfecting purposes, or to produce medicinal action on certain parts of the body with which they are brought into contact.

In the following Lessons we will endeavour to apply the principles, the study of which has hitherto occupied our attention.

CONCLUDING LESSONS.

EXAMPLES AND EXERCISES.

I purpose devoting our concluding Lessons to examples and exercises; and I trust that the arrangement I have adopted will be found to conduce to convenience, and to invest the subject with additional interest.

ANTACIDS.

Antacids are medicines which counteract acidity, acting chemically by neutralizing the acid.

“Direct” antacids are those which directly neutralize the acidity of the stomach and intestines; “Remote” antacids are those which increase the normal alkalinity of the blood, and, through it, correct acidity of the secretions. Antacids may be divided into three classes:—1. Those which are both direct and remote. 2nd. Those which are direct but not remote, as ammonia and its salts. 3rd. Those which are remote but not direct, for instance potash or soda combined with some vegetable acid, as citric or tartaric. In the latter case the vegetable acid becomes converted into carbonic acid in the system. The physician will remember that antacids are only *palliative* in their action. The administration of alkalies should not be continued too long; when a course of alkalies is indicated, they should be combined with some vegetable tonic, and they should be discontinued at intervals.

The following is a list of the antacids with their pharmacopœial preparations and doses:—

Ammon. Liquor. m_{x} .—xxx.

Ammon. Carb. gr. iii.—x.

Spt. Ammon. Ar. m_{xxx} .—3*i.*

Calcis Liquor. $\frac{3}{i}$.—iv.

Calcis Liquor Sacch. m_{xv} .—3*i.*

Calcis Carb. *Præcip.* gr. x.—3*i.*

Creta *Præp.* gr. x.—3*i.*

Mist. Creta. $\frac{3}{i}$.—ii.

Pulv. Creta Ar. gr. x.—3*i.*

Pulv. Creta Ar. c. Opio. gr. x.—xxx.

Hydrarg. c. Creta. gr. iii.—viii.

Lithiæ Carb. gr. iii.—vi.

Liq. Lithiæ Efferv. $\frac{3}{v}$.—x.

Lithiæ Cit. gr. v.—x.

Magnesia. gr. x.—3*i.*

Magnesia Levis. gr. x.—3*i.*

Magnesiæ Carb. gr. x.—3*i.*

Magnesiæ Carb. Levis. gr. x.—3*i.*

Liq. Magnes. Carb. $\frac{3}{i}$.—ii.

Potassæ Liquor. m_{xv} .—3*i.*

Potassæ Bicarb. gr. x.—xl.

Liq. Potassæ Efferv. $\frac{3}{v}$.—x.

Potassæ Carb. gr. x.—xxx.

Sodæ Liquor. m_{x} .—3*i.*

Sodæ Bicarb. gr. x.—3*i.*

Liq. Soda Efferv. $\frac{3}{v}$.—x.

Trochisci Soda Bicarb. 1—6.

Sodæ Carb. gr. v.—xxx.

Soda Carb. Exsiccat. gr. iii.—x.

REMOTE ANTACIDS.

Salts of potash or soda combined with a vegetable acid, as citric or tartaric.

1. Prescribe a mixture for a case of acidity with flatulent distension of the stomach.

R

Liquoris Ammoniæ, drachmam.

Misturæ Amygdalæ, uncias octo.

Misce. Fiat mistura. Capiat cochlearia duo magna bis terve in die.

In this case we select *ammonia* as it is a volatile antacid; *carbonate* of ammonia would be inadmissible, as the evolution of carbonic acid in the stomach would increase the flatulence. The student will notice that we have prescribed the ammonia in a large quantity of *bland* fluid, a precaution which it is always well to observe in administering liquor ammonia.

2. Prescribe Carbonate of Ammonia in effervescence.

R

Ammoniæ Carbonatis, grana sex.

Syrupi Aurantii, drachmas duas.

Aquaæ, drachmas decem.

Misce. Fiat haustus, cui, tempore capiendi, adde Succi Limonis recentis cochleare medium unum, et in effervescentiâ sumatur.

Not unfrequently at examinations and in practice you will be required to prescribe certain substances in a state of effervescence. The following table, showing the proportions which should be ordered to produce exact neutralization, will be found of use:—

	Lemon Juice.	Citric Acid.	Tartaric Acid.
20 grains of	Ammon. Carb.	3vi.	gr. 23½
	Pot. Bicarb.	3iii.	gr. 14
	Sodæ Bicarb.	3iv.	gr. 16

3. Prescribe a mixture containing Carbonate of Ammonia with a salt of iron and a vegetable infusion.

R

Ammoniæ Carbonatis, semidrachmam.

Ferri Tartarati, grana quadraginta.

Syrupi Zingiberis, unciam.

Infusi Quassiae, ad uncias octo.

Misce. Fiat mistura. Capiat cochlearia duo magna bis in die.

This prescription serves to illustrate several important facts. It shows that carbonate of ammonia, although incompatible with other salts of iron, may be given with ferrum tartaratum. Syrup of ginger is preferred to syrup of orange, which is turned black with the iron. Infusion of quassia which does not contain tannin is an excellent vehicle for iron salts.

4. Prescribe an Alkali in combination with Sulphate of Magnesia.

R

Sodæ Bicarbonatis, drachmas duas.

Magnesiæ Sulphatis, uncias duas.

Syrupi Aurantii, unciam.

Infusi Cascarillæ, ad uncias octo.

Misce. Fiat mistura, cuius capiat cochlearia duo ampla sextis horis.

Carbonates of the alkalis are incompatible with sulphate of magnesia, but the bi-carbonates may be prescribed with that salt. Carbonate of ammonia is not incompatible with sulphate of magnesia.

5. Prescribe a stimulating Antacid Draught.

R

Ammoniæ Carbonatis, grana quinque.

Spiritus Ammoniæ Aromatici, semidrachmam.

Spiritus Chloroformi, semidrachmam.

Aqua Camphoræ, unciam cum semissè.

Misce. Fiat haustus, statim sumendus.

6. Prescribe for a case of acidity with diarrhoea.

R

Tincturæ Opii, semidrachmam.

Spiritus Chloroformi, drachmam.

Misturæ Cretæ, uncias tres.

Aqua Menthae Piperitæ, uncias tres.

Misce. Fiat mistura, cuius sumantur cochlearia duo magna post unamquamque sedem mollem, phialâ prius concussâ.

Preparations of lime should always be selected in cases of acidity with diarrhoea.

The following is an agreeable method of administering Lime-water :—

R

Liquoris Calcis, uncias duas.

Aqua Laurocerasi, guttas quindecim.

Lactis Recentis, uncias duas.

Misce. Fiat haustus, mane sumendus.

7. Prescribe powders for a case of Lithic Acid Diathesis.

R

Lithiæ Carbonatis, grana triginta.

Pulveris Colchici, grana duodecim.

Misce, et in pulveres sex divide. Sumat

When urate of soda is deposited in the tissues, the administration of the lithia salts is preferable to potash or soda, as urate of lithia is formed, which is very soluble and easily eliminated from the system. Colchicum will generally be found a judicious combination with lithia.

8. Prescribe a mixture containing Lithia.

R

Lithiæ Citratis, drachmam.

Syrupi Limonis, unciam.

Tincturæ Colchici, drachmam cum semisse.

Aquæ ad uncias octo.

Misce. Fiat mistura. Capiat cochlearia duo magna bis in die.

The citrate is more soluble than the carbonate of lithia, and hence is better suited for the fluid form of administration. Syrup of lemon is preferred to that of orange, as being a more scientific combination with a citrate.

9. Prescribe a mixture for a case of acidity with constipation.

R

Magnesiæ, semiunciam.

Mucilaginis Tragacanthæ, uncias quatuor.

Syrupi Zingiberis, unciam.

Aquæ Menthæ Piperitæ, uncias tres.

Misce. Fiat mistura. Capiat cochlearia duo magna ter in die, phialâ prius concussâ.

The student might have suggested the addition of sulphate of magnesia to the above, but very often the magnesia becomes aggregated into a solid mass when prescribed with the latter salt. The above prescription illustrates the necessity of suspending an insoluble substance by means of an excipient.

10. Prescribe a mixture for a case in which we desire to correct acidity of the urine.

R

Liquoris Potassæ, drachmas duas.

Tincturæ Calumbæ, drachmas duas.

Infusi Calumbæ, ad uncias sex.

Misce. Fiat mistura. Capiat cochlearia duo magna ter in die.

We select potash in such a case, as its action is chiefly directed towards the urinary organs.

Liquor potassæ may well be given in beer or broth, which will effectually conceal its nauseous taste.

11. Prescribe for a case of acidity with deficient secretion of bile.

R

Sodæ Bicarbonatis, drachmam cum semisse.

Decocti Taraxaci, uncias sex.

Misce. Fiat mistura. Capiat cochlearia duo magna bis in die.

In this case the soda salts are the appropriate remedies, as they exert a special action on the liver.

12. Prescribe pills containing Carbonate of Soda.

R

Sodæ Carbonatis exsiccatæ, drachmam.

Pulveris Ipecacuanhæ, grana decem.

Saponis duri, grana viginti.

Syrupi, quantum sufficit ut fiat massa, in pilulas viginti dividenda, è quibus capiat tres in dies.

It will at once be seen that the *dried* carbonate of soda is the only preparation adapted for administration in pill.

ANTHELMINTICS.

Medicines which destroy or expel worms ; the former are termed *Vermicides*, the latter *Vermifuges*.

Anthelmintics may be divided into three classes :—

1. Those which destroy but do not expel the worm,
2. Those which expel but do not destroy the worm as ordinary purgatives.
3. Those which both destroy and expel the worm.

Different worms inhabit different portions of the intestines ; thus the *Ascaris lumbricoides* generally occupies the small intestines, the *Trichocephalus dispar* inhabits the cæcum and large intestine, while the *Ascaris vermicularis* resides in the rectum, and is hence best treated by enemata. The *Tænia solium* occupies the small intestines extending upwards and downwards.

The action of anthelmintics is only temporary, and consequently we must correct the state of constitution which predisposes to the generation of worms ; this is best effected by strict attention to hygienic rules, and the administration of bitter tonics, as quassia and *nux vomica*, and preparations of iron. As a rule, the administration of anthelmintics should be continued for some time after the expulsion of the worms. Most of the anthelmintics act especially on the tape worm, but *santonica* acts more effectually on the round worms, while oil of turpentine is equally efficacious against both round and flat worms. As a rule, the administration of anthelmintics should be accompanied or followed by a cathartic ; this scarcely applies to *kamala* which, of itself, possesses purgative properties.

Anthelmintics should be given on an empty stomach, or should be preceded by a cathartic, in order to expose the worm to the full action of the medicine.

The following anthelmintics are officinal.—

Cusso. 3*ii.*—*iv.*
Infusum. 3*iv.*—*viii.*
Filix-mas. 3*i.*—*ii.*
Extract. Liquid. 3*xv.*—*xxx.*
Granati Radicis Cort.
Decoctum. 3*i.*—*ii.*
Kamala. 3*i.*—*ii.*
Sabadilla. gr. *i.*—*v.*
Santonica. gr. *x.*—*3.*
Santoninum. gr. *ii.*—*iv.*
Terebinth. Oleum. 3*ii.*—*vi.*
Confectio. 3*i.*—*iii.*
Enema.

1. Prescribe Cusso in form of an electuary.

R

Cusso, in pulvere, drachmas tres.
Mellis, quantum sufficiat ut fiat Electuarium. Cras primo
mane sumendum. Postea adhibeatur mistura purgans ad
plenam alvi solutionem.

I may here mention that if it be required to administer the infusion of kousso, fresh lemon-juice may be advantageously added.

2. Order a draught containing Oil of male-fern.

R

Extracti Filicis liquidi, semidrachmam.
Misturæ Amygdale, unciam cum semisse.
Misce. Fiat haustus, primo mane sumendus. Postea adhi-
beatur mistura purgans ad plenam alvi solutionem.

The liquid extract of male-fern should be given, as above, suspended in some emulsified fluid.

3. Prescribe Pomegranate.

R

Tincturæ Jalapæ, unciam.
 Tincturæ Nucis Vomicæ, drachmam cum semisse.
 Syrupi Zingiberis, unciam.
 Decocti Granati radicis, uncias sex.
 Misce. Fiat mistura. Capiat cochlearia duo magna omni mane.

This will be found an excellent combination in cases where we desire to correct the state of constitution which predisposes to the generation of worms. The powdered root-bark of pomegranate may also be well given in the form of powder combined with sabadilla and some aromatic vegetable powder, as the compound powder of cinnamon.

4. Write a prescription containing Kamala.

R

Kamala, drachmas tres.
 Mellis, quantum sufficiat ut fiat bolus.
 Detur jejuno stomacho.

Bolus or confection is the only available mode of administering kamala.

5. Order Sabadilla for a child.

Pulveris Sabadilleæ, grana decem.
 Syrupi Rhei, unciam.
 Misce. Fiat mistura. Cochleare medium cras primo mane sumendum.

The above is the form of prescription recommended by M. Cazin, of Boulogne.

6. Write a prescription ordering pills of Santonine and Aloes.

R

Santonini, grana duodecim.
 Pilulæ Aloes et Ferri, grana octodecim.
 Misce. Fiant pilulæ sex, quarum capiat unam omni mane. Deaurentur pilulæ.

This will be found a very useful formula for the treatment of the short thread-worm. The administration in the form of silvered pills, and the special action of aloes on the lower portion of the bowel, have been considered in devising this combination.

Santonine may also be very well given with castor oil, as recommended by Küchenmeister.

7. Order an enema for an adult containing Oil of Turpentine and Santonine.

R

Olei Terebinthinae, unciam.

Santonini, grana quinque.

Mucilaginis Amyli, uncias quindecim.

Misce. Fiat enema. Injiciatur horâ somni tertîâ quâque nocte.

The above will be found extremely useful in the treatment of the short thread-worm.

ANTISPASMODICS.

Medicines which allay spasm.

Antispasmodics may be divided into *Direct* and *Indirect*. The former act by exerting a tonic influence on the cord, the latter by removing the exciting cause of the spasmody action.

Antispasmodics vary in their effects on individuals; they act rapidly, but soon lose their power. During a course of antispasmodic treatment it will be well to vary the remedy at times.

We have to treat here only of the Direct Antispasmodics, of which the following are in the *Pharmacopœia* :—

Assafætida. gr. v.—xx.

Enema.

Pil. Aloes et Assafætidae. gr. v.—x.

Pil. Assafætidae Comp. gr. v.—x.

Spiritus Ammoniæ Fætid. ℥xxx.—3.

Tinctura Assafætidae. ℥xxx.—3.

Castoreum. gr. v.—x.

Tinctura. ℥xxx.—3ii.

Galbanum. gr. x.—xxx.

Pil. Assafætidae Comp. gr. v. x.

Moschus. gr. v.—x.

Ruta. gr. xx.—xxx.

Oleum. ℥i.—v.

Sumbul. gr. xx.—3.

Tinctura. ℥x.—xxx.

Valeriana. gr. x.—xxx.

Infusum. ʒi.—ii.

Tinctura. ℥xxx.—3ii.

Tinctura Valerianæ Ammoniata. ℥xxx.—3.

Sodæ Valerianas. gr. i.—v.

Zinci Valerianas. gr. i.—iii.

In the prescriptions in the two preceding sections, we have written the doses in full; this will not be necessary in future, and we shall accordingly employ the symbols in general use.

i. Prescribe Assafætida in a fluid form.

R

Spiritus Ammoniæ Fætidi, ʒiv.

Spiritus Ammoniæ Aromatici, ʒiv.

Spiritus Chloroformi, ʒii.

Aquæ Camphoræ ad ʒvii.

Misce. Fiat mistura. *Sumat cochlearia duo magna tertia quaque horâ.*

The foetid spirit of ammonia should always be selected if it be desired to administer a fluid preparation of assafætida by the mouth. If it be desired to prescribe the tincture of assafætida, the prescriber will

remember that, like all other tinctures of gum-resins, it must be suspended with mucilage.

2. Order a dozen pills to consist of Musk and Camphor.

R

Moschi, gr. xviii.

Camphoræ, gr. xii.

Spiritus rectificati, ℥iii.

Theriacæ, quantum sufficit ut fiat massa, in pilulas duodecim dividenda è quibus capiat duas ter in die.

The object of the rectified spirit is to pulverize the camphor. As a rule it will not be necessary for the prescriber to order it in his formula.

3. Write for a draught to contain Musk.

R

Moschi, gr. x.

Ammoniæ Carbonatis, gr. ii.

Spiritus Ætheris, ℥xxx.

Mucilaginis Acaciæ, ʒiv.

Aquæ Camphoræ. ʒi.

Misce. Fiat haustus, horâ somni, vel vespertinâ sumendus.

In this prescription carbonate of ammonia is introduced, as it increases the efficacy of musk ; spirit of ether is employed, as ether is a good solvent of musk. Probably camphor-water is the best vehicle which could be selected.

4. Prescribe a mixture containing Sumbul.

R

Tincturæ Sumbuli, ʒii.

Spiritus Chloroformi, ʒii.

Aquæ Menthæ Piperitæ, ad ʒvi.

Misce. Fiat mistura, sumat cochlearia duo magna tertiiis vel quartis horis.

5. Prescribe a mixture containing Valerian.

R.

Tincturæ Valerianæ Ammoniatæ, 3*iii.*Tincturæ Castorei, 3*iii.*Spiritūs Chloroformi, 3*ii.*Aquæ Camphoræ, ad 3*viii.*

Misce. Fiat mistura, cuius sumat cochlearia duo magna sextis horis.

The ammoniated tincture is certainly the most eligible preparation of valerian for administration in the fluid form by the mouth.

6. Prescribe Valerianate of Zinc.

R.

Zinci Valerianatis, gr. *xxiv.*

Confectionis Rosæ Caninæ, quantum sufficit ut fiat massa, in pilulas duodecim dividenda. Sumat unam bis in die. Deaurentur pilulæ.

On account of their disagreeable taste, it is best to administer the valerianates in the form of pill.

Valerianate of zinc is incompatible with all acids, most metallic salts, soluble carbonates, and vegetable astringents. Valerianate of quinine, although not official, is often prescribed, and is a powerful and valuable antispasmodic.

ASTRINGENTS.

Medicines, the primary effect of which is to diminish secretion and excretion, and which secondarily exert a tonic influence.

Astringents may be said to act in two ways:—

1. By diminishing the alkalinity of the blood, they increase its coagulative tendency. (Acids.)
2. By causing condensation of albuminous tissues,

and by inducing contraction of muscular fibre, they diminish the calibre of capillary vessels, and of the ducts of glands. Whenever a prolonged course of astringents is required, their administration should be stopped at intervals.

The following are the chief Astringents, arranged in alphabetical order : -

Acetum. 3i--ii.

Acid. Acet. Dil. 3i--ii.

Oxymel. 3i--ii.

Acid. Carbolic. gr. i.--iii.

Glycerinum. ℥v.--x.

Suppositoria Acid. Carbolic. cum Sapone.

Acid. Hydrochlor. Dil. ℥x.--xxx.

Acid. Nitric. Dil. ℥x.--xxx.

Acid. Nitro-Hydrochlor. Dil. ℥v.--xx.

Acid. Phosph. Dil. ℥x.--xxx.

Acid. Sulphuric. Aromat. ℥x.--xxx.

Acid. Sulphuric. Dil. ℥x.--xxx.

Alumen. gr. x.--xx.

Alumen Exsiccatum.

Belae Fructus.

Extract. Liquid. 3i--ii.

Catechu Pallidum. gr. x.--xxx.

Infusum. 3i--ii.

Pulvis Comp. gr. xx.--xl.

Tinctura. ℥xxx.--3ii.

Trochisci. 1--6.

Creasotum. ℥i.--iii.

Mistura. 3i--ii.

Unguentum.

Vapor.

Creta Preparata. gr. x.--3i.

Mistura. 3i--ii.

Pulv. Creta Aromat. gr. x.--3i.

Pulv. Creta Aromat. cum Opio. gr. x.--xl.

Cupri Sulphas. gr. 4--ii.

Ergota. gr. xx.--xxx.

Extract. Liquid. ℥x.--xxx.

Ergota—

Infusum. ʒi.—ii.*Tinctura.* ℥x.—ʒi.

Ferri Perchlor. Liquor. ℥x.—xxx.

Ferri Perchlor. Tinct. ℥x.—xxx.

Ferri Pernitrat. Liquor. ℥xxx.—ʒ.

Ferri Persulph. Liquor.

Ferri Sulphas. gr. i.—v.

Ferri Sulphas Exsiccata. gr. ½—iii.*Ferri Sulphas Granulata.* gr. i.—v.

Galla—

Tinctura. ʒi.—ii.*Unguentum.**Unguentum Galla cum Opio.**Acid. Gallic.* gr. iii.—xx.*Glycerinum.* ℥x.—ʒ.*Acid. Tannic.* gr. iii.—xx.*Glycerinum.* ℥x.—xxx.*Suppositoria.**Trochisci.* 1—6.

Hæmatoxyli Lignum.

Decoctum. ʒi.—ii.*Extractum.* gr. x.—xxx.

Kino. gr. x.—xxx.

Pulvis Comp. gr. v.—xx.*Tinctura.* ℥xxx.—ʒii.

Krameriae Radix. gr. xxx.—ʒi.

Extractum. gr. v.—xx.*Infusum.* ʒi.—ii.*Tinctura.* ʒi.—ii.

Maticæ Folia. gr. xxx.—ʒi.

Infusum. ʒi.—iv.

Plumbi Acetas. gr. ½—iii.

Pil. Plumbi cum Opio. gr. iv.—viii.*Suppos. Plumbi Comp.**Unguent. Plumbi Acet.*

Plumbi Carbonas.

Unguent. Plumbi Carb.

Plumbi Oxidum.

Emplastrum.

Plumbi Subacetatis Liquor.

*Liquor Plumbi Subacet. Dilut.**Unguent. Plumbi Subacet. Co.*

Quercus Cortex.

Decoctum. $\frac{3}{2}$ i.—ii.

Rosae Gallicae Petala.

Confectio. $\frac{3}{2}$ i.

Infusum Rosae Acidum. $\frac{3}{2}$ i.—ii.

Syrupus. $\frac{3}{2}$ i.

Sodæ Biboras. gr. v.—xxx.

Mel Boracis.

Glycerinum Boracis. m_{xxx} .— $\frac{3}{2}$ i.

Uvæ Ursi Folia. gr. x.—xxx.

Infusum. $\frac{3}{2}$ i.—ii.

Zinci Acetas. gr. i.—ii.

Zinci Carbonas. gr. i.—v.

Zinci Oxidum. gr. i.—x.

Unguentum.

Zinci Sulphas. gr. i.—v.

1. Order a gargle to contain Acetum.

R.

Aceti, $\frac{3}{2}$ ii.

Mellis, $\frac{3}{2}$ i.

Aquaæ, $\frac{3}{2}$ vii.

Misce. Fiat gargarisma, sape in die utendum.

2. Order a mixture to contain Carbolic Acid.

B.

Glycerini Acidi Carbolici, $\frac{3}{2}$ i.

Spiritus Juniperi, m_{xv} .

Aquaæ, ad $\frac{3}{2}$ viii.

Misce. Fiat mistura, cuius capiat cochlearia duo magna sextis horis.

The glycerine of carbolic acid affords a very eligible form for the internal administration of that drug. The addition of spirit of juniper, as in the *Mistura Creasoti*, will help to conceal the taste.

3. Prescribe a mixture containing one of the mineral acids.

R.

Acidi Nitrici diluti, $\frac{3}{2}$ ii.
 Syrupi Aurantii, $\frac{3}{2}$ js.
 Infusi Quassiae, ad $\frac{3}{2}$ vi.
 Misce. Fiat mistura, de quâ sumatur uncia quartis horis.

It is a good rule in administering the dilute mineral acids internally, to give them in combination with a vegetable tonic.

4. Order a Nitro-muriatic Acid bath.

R.

Acidi Nitrici, $\frac{3}{2}$ js.
 Acidi Hydrochlorici, $\frac{3}{2}$ iii.
 Aquæ calidæ, cong. xv.
 Misce. Fiat balneum.

The prescriber should give directions for this bath to be prepared in a wooden vessel. The patient should remain in it for about fifteen or twenty minutes.

5. Prescribe a mixture to contain Alum.

R.

Aluminis, $\frac{3}{2}$ ii.
 Syrupi Rosæ Gallicæ, $\frac{3}{2}$ i.
 Infusi Rosæ Acidi, $\frac{3}{2}$ vii.

Misce. Fiat mistura. Sumat cochlearia duo ampla tertiiis horis.

The alum is readily soluble in the acid infusion of roses.

“Dried” alum is only intended for external use.

6. Prescribe a mixture containing Bael, Kino, and Matico.

R.

Extracti Belæ liquidi, $\frac{3}{2}$ i
 Tincturæ Kino, $\frac{3}{2}$ iv.

Syrupi Papaveris, $\frac{3}{2}$ i.
 Infusi Maticæ, ad $\frac{3}{2}$ viii.
 Misce. Fiat mistura. Sumat cochlearia duo ampla tertiiis horis.

7. Prescribe Creasote in mixture.

R.
 Creasoti, $\frac{1}{2}$ vi.
 Mucilaginis Acaciæ,
 Aquæ Camphoræ, ana $\frac{3}{2}$ iii.
 Misce. Fiat mistura. Capiat cochlearia duo magna secundis vel tertiiis horis.

Creasote is rendered emulsive with water by mucilage. The *Mistura Creasoti* of the Pharmacopœia is an excellent form for the administration of creasote.

Oxide of silver is believed by some to be a valuable astringent in internal haemorrhages, and it might be thought desirable to combine it with creasote in the form of pill. It must be remembered that unless the oxide of silver be first mixed with liquorice or some other powder, the mass will take fire.

8. Prescribe a mixture of Tincture of Catechu, Laudanum, and Chalk.

R.
 Tincturæ Catechu, $\frac{3}{2}$ i.
 Tincturæ Opii, $\frac{3}{2}$ i.
 Misturæ Cretæ, $\frac{3}{2}$ vii.
 Misce. Fiat mistura, cujus sumantur cochlearia duo magna post singulas dejectiones liquidas.

Chalk mixture is very generally employed as a vehicle for more active astringents.

9. Order a mixture of Tincture of Perchloride of Iron in a tonic vegetable infusion.

B.

Tincturæ Ferri Perchloridi, 3ii.

Syrupi Simplicis, 3vi.

Infusi Quassiæ, 3v.

Misce. Fiat mistura. Capiat cochlearia duo magna sextis horis.

Infusions of quassia and calumba may be prescribed with salts of iron, but astringent vegetable infusions, and infusions of cascarilla, chamomile, chiretta, cinchona, cloves, cusparia, digitalis, gentian, hops, and orange, are turned brown or black with soluble preparations of iron.

10. Order half-a-dozen pills of Sulphate of Iron.

R.

Ferri Sulphatis exsiccatæ, gr. xviii.

Mannæ, gr. xii.

Misce. Fiat massa, in pilulas sex dividenda. Capiat unam bis in die.

The "dried" sulphate is preferable for administration in the form of pill, as three grains of it are equal to five of the crystallized salt. Manna is an excellent excipient.—(Squire.)

11. Prescribe pills of Gallic Acid.

R.

Acidi Gallici, 3i.

Glycerini, 7viii.

Misce. Fiant pilulæ sex; quarum capiat unam ter in die.

If it be required to administer gallic acid in a fluid form, it must be dissolved in an aqueous fluid by the aid of glycerine, or suspended by mucilage; tannic acid, being extremely soluble in water does not require any such procedure.

12. Order a mixture to resemble the *Pilula Plumbi cum Opio*.—(B. P.)

R.

Plumbi Acetatis, gr. xxiv.

Morphiae Acetatis, gr. i.

Acidi Acetici diluti, 3iv.

Aqua destillatae, ad 3viii.

Misce. Fiat mistura. Capiat cochlearia duo magna tertia quaque horâ.

In this case we select acetate of morphia in preference to tincture of opium, as the latter preparation gives with acetate of lead a precipitate of meconate of lead. The object of the dilute acetic acid is to prevent the conversion of the acetate into carbonate of lead.

13. Prescribe a gargle of Borax.

R.

Glycerini Boracis, 3ii.

Aqua, 3vi.

Misce. Fiat gargarisma, saepe utendum.

The prescriber might possibly select the acid infusion of roses as the vehicle in this case, but the result would be an unsightly green fluid. The acid infusion of roses, however, forms an excellent vehicle for alum gargles.

14. Prescribe an injection of Sulphate of Zinc.

R.

Zinci Sulphatis, gr. viii.

Aqua, 3iv.

Misce. Fiat injectio, quae in urethram injiciatur mane et nocte.

CATHARTICS.

Cathartics may be defined as medicines which accelerate or increase the alvine evacuations.

They differ as to their mode, degree, and sphere of action. With regard to their *mode of action*, some cathartics act by increasing the peristaltic motion, others by increasing the mucous secretion, and others by increasing the supplementary intestinal secretions, *e.g.* the bile.

Cathartics are divided into several classes, according to their *degree of action* :—

1. *Laxatives*—cathartics which operate very mildly, and which, while they slightly increase the peristaltic motion, do not increase the amount of secretion.

2. *Simple Purgatives* differ from laxatives in causing a greater increase of peristaltic motion, and also in causing a slight increase of secretion.

3. *Drastic Purgatives* differ from simple purgatives only in degree of action.

4. *Hydragogue Purgatives* increase the secretion to such an extent as to produce a watery evacuation.

5. *Saline Purgatives* produce an effect similar to, but slighter than, the hydragogue purgatives, and are not drastic in their action.

6. *Cholagogue Purgatives* produce a flow of bile into the intestine.

Cathartics differ as to their *sphere of action*. Some act on the large intestine, some on the small intestine, and some on the entire canal.

The chief objects sought to be effected by purgatives are :—

1. To unload the bowel.
2. To increase the secretion of the neighbouring intestinal glands.
3. To relieve congestion of internal organs by unloading the veins of the canal.
4. To produce a derivative effect.

Probably there is no class of medicines in which *combination* is so useful as in cathartics. Combination of several different purgatives will often be found more advantageous than the administration of a single drug. Some substances, as *nux vomica* and sulphate of iron, are combined with purgatives with the object of giving tone to the intestine; other substances, as *ipecacuanha* and antimonial preparations, increase the mucous secretion and are for this reason often combined with cathartics. Not unfrequently it will be necessary to correct the griping properties of some purgatives, and this may be effected by the addition of *belladonna*, *stramonium*, *henbane*, aromatic oils, &c.

The prescriber should carefully attend to the *time of day for the administration* of cathartics. Where the active principle of the drug employed is resinous, or when the medicine is slow in action, it should be given at night; salines should be administered in the morning.

LAXATIVES.

Cassia. 3*ii.*—*upw.*

Ficus.

Magnesia. gr. *xx.*—*3i.*

Magnesia Levis. gr. *xx.*—*3i.*

Magnesiae Carbonas. gr. *xx.*—*3i.*

Magnesiae Carbonas Levis. gr. *xx.*—*3i.*

Liquor Magnesiae Carbonatis. *3i.*—*ii.*

Manna. *3i.*—*3i.*

Mel.

Oleum Olivæ. 3i.—3i.
Oleum Ricini. 3i.—3i.

Prunum.

Sulphur Sublimatum. gr. xx.—3i.
Confectio. 3i.—ii.

Sulphur Præcipitatum. gr. xx.—3i.
Tamarindus.

SIMPLE PURGATIVES.

Aloe Barbادرensis. gr. ii.—vi.

Enema.

Extractum Aloes Barb. gr. ii.—vi.

Pilula Aloes Barb. gr. iv.—xv.

Pilula Aloes et Ferri. gr. v.—x.

Aloe Socotrina. gr. ii.—vi.

Decoctum Aloes Comp. 3iv.—3ii.

Enema.

Extractum Aloes Socot. gr. ii.—vi.

Pilula Aloes Socot. gr. iv.—xv.

Pilula Aloes et Assafetidæ. gr. v.—xv.

Pilula Aloes et Myrrhæ. gr. v.—xv.

Tinctura Aloes. 3i.—iii.

Vinum Aloes. 3i.—ii.

Jalapa. gr. x.—xxx.

Resina. gr. ii.—v.

Extractum. gr. v.—xv.

Pulvis Jalapæ Comp. gr. xx.—3i.

Tinctura. 3ss.—ii.

Rhamni Succus.

Syrupus. 3iv.—3i.

Rhei Radix. gr. x.—xxx.

Extractum. gr. v.—xv.

Infusum. 3i.—ii.

Pilula Rhei Comp. gr. v.—x.

Pulvis Rhei Comp. gr. xx.—3i.

Syrupus. 3i.—iv.

Tinctura. 3iv.—3i.

Vinum. 3i.—ii.

Senna. gr. xxx.—3ii.

Confectio. 3i.—ii.

Infusum. 3i.—ii.

Mistura Sennæ Comp. 3i.—isa.

Senna—

Tinctura. 3*i.*—iv.
Syrupus. 3*i.*—upwards for children.

DRASTIC PURGATIVES.

Cambogia. gr. i.—v.

Pilula Cambogiae Co. gr. v.—xv.

Colocynthidis Pulpa. gr. ii.—viii.

Extractum Colocynthidis Co. gr. iii.—x.

Pilula Colocynthidis Co. gr. v.—x.

Pilula Colocynthidis et Hyoscyami. gr. v.—x.

Crotonis Oleum. $\frac{1}{4}$ —i.

Jalapa.

Vide "Simple Purgatives."

Scammoniae Radix.

Scammonium. gr. v.—x.

Confectio. gr. x.—xxx.

Pulvis Scammonii Co. gr. x.—xx.

Scammonii Resina. gr. iii.—viii.

Mistura. 3*iv.*—*ii* for a child.

Pilula Scammonii Co. gr. v.—xv.

HYDRAGOGUE PURGATIVES.

Cambogia.

Vide "Drastic Purgatives."

Elaterium. gr. $\frac{1}{4}$ —i.

Pulvis Comp. gr. $\frac{1}{4}$ —v.

Potassæ Tartras Acida. 3*ii.*—v.

SALINE PURGATIVES.

Magnesiae Citras.

Liquor. 3*v.*—x.

Magnesiae Sulphas. 3*ii.*—iv.

Enema.

Potassæ Sulphas. gr. xx.—3*ii.*

Potassæ Tartras. 3*ii.*—iv.

Potassæ Tartras Acida. 3*ii.*—v.

Soda Tartarata. 3*ii.*—iv.

Sodæ Phosphas. 3*iv.*—3*i.*

Sodæ Sulphas. 3*ii.*—3*i.*

CHOLAGOGUE PURGATIVES.

Aloe.

Vide "Simple Purgatives."

Hydrargyri Subchloridum. gr. ii.—v.

Hydrargyri Pilula. gr. iii.—viii.

Hydrargyrum cum Cretâ. gr. iii.—viii.

Podophylli Radix. gr. x.—xx.

Podophylli Resina. gr. $\frac{1}{4}$ —ii.

Taraxacum.

Decoctum. 3ii.—iv.*Extractum.* gr. v.—x.*Succus.* 3i.—3ii.

1. Prescribe pills containing Aloes.

R

Extracti Aloes Socotrinæ, gr. xxiv.

Pulveris Ipecacuanhæ, gr. vi.

Extracti Gentianæ, quantum sufficit ut fiant pilulæ duodecim.

Una ante prandium sumenda.

The pill form is well adapted for the administration of aloes on account of the extremely bitter taste of this drug. In the fluid form its taste is well concealed by liquorice. In the above prescription we have ordered the *extract* of aloes, as it is more active and acts more pleasantly than aloes itself. The prescriber will do well to remember that the purgative effects of aloes are increased by bitter tonics. Aloes should not be given during pregnancy, or when there are haemorrhoids, as it acts chiefly on the lower bowel.

2. Prescribe Gamboge in mixture.

R

Cambogiae, gr. xxiv.

Liquoris Ammoniæ, 3ii.

Tere simul, et adde

Syrupi Zingiberis, 3iss.

Aqua Menthae Piperitae ad 3vi.

Misce. Fiat mistura. Capiat cochleare magnum tertiam quamque horam donec plene responderit alvus.

The foregoing prescription indicates several important points concerning the administration of gamboge. It shows that gamboge may be given in the fluid form in emulsion or alkaline solution, and it illustrates the fact that it is advisable to combine with it some aromatic, such as ginger. Gamboge is generally advantageously combined with other cathartics, as calomel, jalap, elaterium, bitartrate of potash, &c.

3. Prescribe half-a-dozen pills, each to contain two grains of Compound Extract of Colocynth, two grains of Compound Rhubarb Pill, and one grain of Blue Pill.

R

Extracti Colocynthidis Compositi, gr. xii.

Pilulae Rhei Compositae, gr. xii.

Pilulae Hydrargyri, gr. vi.

Misce. Divide in pilulas sex. Capiat duas pro re natam.

Colocynth should always be prescribed in combination with other cathartics on account of its drastic properties.

4. Prescribe Croton Oil.

R

Olei Crotonis, mii.

Micæ panis quantum sufficit ut fiat pilula. Statim sumenda, et horis duabus repetenda si opus sit.

Croton oil should not be administered in the fluid form.

5. Order pills each to contain $\frac{1}{16}$ th of a grain of Elaterium.

R

Pulveris Elaterii, gr. i.

Pulveris Sacchari Lactis, gr. xvi.

Extracti Gentianæ, quantum sufficit ut fiat massa, in pilulas sexdecim dividenda è quibus capiat unam ut opus sit.

The foregoing prescription illustrates the important principle that very active substances, the dose of which is very small, should be "diluted" with some inert powder, so as to ensure accurate division. This is exemplified by the *Pulvis Elaterii Compositus* of the *Pharmacopœia*.

6. Prescribe Calomel in pills.

R

Hydrargyri Subchloridi, gr. xii.

Mannæ, gr. vi.

Pulveris Tragacanthæ Compositæ, gr. vi.

Misce. Divide in pilulas sex; capiat duas pro re natâ.

This is the method of making calomel into pills recommended by Mr. Squire. Pills of calomel made with mucilage become very hard on keeping, and if made with a conserve they are apt to become moist. Calomel is incompatible with alkalies, and hence soap is unsuited as an excipient.

7. Give the formula for the ordinary "Black," "White," and "Red Mixtures of Hospitals."

R

Magnesiae Sulphatis, 3iss.

Extracti Glycyrrhizæ, 3ii.

Tincturæ Sennæ, 3i.

Tincturæ Cardamomi Compositæ, 3iv.

Infusi Sennæ ad 3viii.

Misce. Fiat mistura. Sumat cochlearia duo magna quartis horis ad effectum.

R

Magnesiæ Sulphatis, ʒii.

Magnesiæ Carbonatis, ʒii.

Syrupi Zingiberis, ʒi.

Aquæ Menthæ Piperitæ ad ʒviii.

Misce. Fiat mistura. Sumat cochlearia duo magna quartis horis ad effectum, phialâ prius bene agitatâ.

R

Magnesiæ Sulphatis, ʒii.

Infusi Rosæ Acidi, ʒviii.

Misce. Fiat mistura. Sumat cochlearia duo magna ad effectum.

These are also frequently prescribed in the form of draught to be taken in the morning.

Free dilution aids the action of sulphate of magnesia. Tincture of an aromatic bitter, a. of cascara, calumba, or orange-peel may be added to hide the taste, but the acid infusion of roses, as in the last prescription, is best adapted for this purpose. Sulphate of magnesia may be prescribed with the alkaline *bi-carbonates*, but is incompatible with carbonates of the alkalies. If sulphate of magnesia be mixed with solution of Rochelle salt, a not unlikely combination, tartrate of magnesia will be precipitated after a time.

8. Prescribe Jalap in combination with Cream of Tartar in the form of draught.

R

Pulveris Jalapæ, gr. xx.

Potassæ Tartratis Acidæ, ʒi.

Syrupi Zingiberis, ʒii.

Aquæ Menthæ Piperitæ, ʒiss.

Misce. Fiat haustus, mane sumendus.

The above is a very useful combination. Jalap is also frequently combined with calomel or scammony. Some aromatic, as ginger, should be added to jalap to counteract the griping tendencies of the latter.

We may here mention that the solubility of cream of tartar is greatly increased by the addition of one-fourth of its weight of boracic acid or borax.

9. Prescribe an Enema to consist of Olive Oil and decoction of Barley.

R

Olei Olivae, ʒii.

Mucilaginis Acaciæ, ʒi.

Decocti Hordei, ʒx.

Tere oleum cum mucilagine donec probè coiverent, tum sensim adde decoctum, ut fiat enema.—*Pereira*.

10. Prescribe a mixture to contain Epsom Salts, a Salt of Iron, and a Bitter Tonic.

R

Magnesiæ Sulphatis, ʒii.

Ferri Sulphatis, gr. xxiv.

Acidi Sulphurici Diluti, ʒii.

Infusi Calumbæ, ad ʒviii.

Misce. Fiat mistura. Capiat cochlearia duo magna omnime.

This prescription scarcely calls for comment. The sulphate of iron at once suggests itself to us as the most suitable salt for combination with sulphate of magnesia. The acid aids materially in concealing the taste, and in promoting the solubility of the salts. Infusion of calumba is one of the few bitter tonics which may be combined with iron.

11. Prescribe pills of Podophyllum.

R

Podophylli Resinæ, gr. ii.

Extracti Belladonnæ, gr. iii.

Pilulæ Colocynthidis Compositæ, gr. xxxvi.

Misce. Fiant pilulæ duodecim; quarum capiat unam nocte quoties alvus fuerit justo adstrictior.

Resin of podophyllum is generally prescribed in this country. It must be remembered that podophyllum varies greatly in its action on individuals; it is therefore well to commence its administration in small doses. Common salt greatly increases its purgative effect, while lactic acid modifies its action.

12. Prescribe a Rhubarb draught.

R

Pulveris Rhei, gr. xxx.

Sodæ Bicarbonatis, gr. xv.

Spiritū Myristicæ, m_lxxx.Syrupi Zingiberis, 3*i.*Aqua_e Menthae Piperite, ad $\frac{1}{2}$ iss.

Misce. Fiat haustus, nocte sumendus.

Bicarbonate of soda counteracts the astringency and covers the taste of rhubarb; spirit of nutmeg and peppermint water also conceal its taste. I may here mention that sulphate of potash increases the purgative effect of rhubarb.

13. Prescribe twelve pills each to contain two grains of Compound Rhubarb Pill, one grain of Blue Pill, one grain of Dried Carbonate of Soda, and one grain of Extract of Henbane.

R

Pilulæ Rhei Compositæ, gr. xxiv.

Pilulæ Hydrargyri, gr. xii.

Sodæ Carbonatis Exsiccatæ, gr. xii.
Extracti Hyoscyami, gr. xii.

Misce et divide in pilulas duodecim. Sumat duas horæ decubitâ.

This formula for an aperient pill for ordinary constipation was recommended by the late Dr. Neligan.

14. Prescribe Castor Oil in draught so as to conceal its taste as much as possible.

R

Olei Ricini, 3*vi.*
Olei Limonis, *m**x.*
Olei Myristicæ, *m**ii.*
Syrupi Simplicis, 3*iss.*
Liquoris Potassæ, 3*i.*
Aquaæ Floris Aurantii, 3*i.*
Misce. Fiat haustus.—*Macnamara.*

15. Prescribe Scammony in combination with Calomel.

R

Pulveris Scammonii, gr. iv.
Hydrargyri Subchloridi, gr. iii.
Potassæ Sulphatis, gr. iv.
Pulveris Zingiberis, gr. v.
Misce. Fiat pulvis catharticus.

Scammony and calomel form a very useful combination, and scammony may also be advantageously combined with other vegetable purgatives. Sulphate of potash corrects its action, and ginger prevents its tendency to gripe. Scammony resin may be well given made into an emulsion with milk, as in the *Mistura Scammonii*, a preparation specially adapted for children.

16. Prescribe Phosphate of Soda.

R

Sodæ Phosphatis, $\frac{3}{2}$ ss.
 Fiat pulvis, in pulmento sumendus.

Phosphate of soda is almost tasteless when administered in mutton broth.

17. Write the formula for a Seidlitz Powder.

R

Sodæ Tartaratæ, $\frac{3}{2}$ ii.
 Soda Bicarbonatis, $\frac{3}{2}$ ii.
 Misce, ut fiat haustus effervescentis eum
 Acidi Tartarici, gr. xxxvii.
 Aquæ, $\frac{3}{2}$ iv.

DIAPHORETICS.

Medicines which increase the cutaneous secretion.

Diaphoretics may be divided into two classes, Stimulant and Sedative. The former act by stimulating the cutaneous capillaries and general vascular system; the latter by relaxing morbid constriction of the cutaneous vessels. The first are indicated when the circulation is slow and languid; while the sedative diaphoretics are indicated when the skin is hot and there are febrile disturbances present. Some diaphoretics, as opium, primarily exert a stimulant action, which is followed by a sedative and relaxing effect.

Probably certain diaphoretics especially aid in the elimination of water from the system, while others chiefly promote the secretion by the skin of certain organic and inorganic matters from the blood.

The following are the chief applications of diaphoretics :—

1. To restore the action of the skin when it has been checked from any cause.
2. To increase the action of the skin in certain cutaneous diseases.
3. To relieve the kidneys.
4. To determine to the surface in fever.

The action of diaphoretics will be aided by exercise ; baths, either of warm water, vapour, or warm air ; tepid diluent drinks. Cold affusion and wet sheet packing are not unfrequently resorted to for the production of diaphoresis.

During the administration of diaphoretics the surface of the body should be kept warm.

The diaphoretics in most common use are :—

STIMULANT.

Ammoniæ Acetatis Liquor. 3ii.—.

Ammoniæ Citratis Liquor. 3ii.—.

Dulcamara.

Infusum. 3i.—ii.

Guaiaci Lignum.

Guaiaci Resina. gr. x.—xxx.

Mistura. 3ss.—ii.

Tinctura Guaiaci Ammoniata. mxxx.—3i.

Mezerei Cortex.

Extractum Mezerei Æthereum.

Opium.

Vide " Narcotics."

Pulvis Ipecacuanhæ Compositus, gr. v.—xv.

Sarsæ Radix.

Decoctum. 3ii.—x.

Decoctum Sarsæ Compositum. 3ii.—x.

Extractum Sarsæ Liquidum. 3ii.—iv.

Sassafras.

Senegæ Radix. gr. xv.—xx.

Infusum. 3i.—ii.

Tinctura. 3ss.—ii.

Serpentariae Radix. gr. x.—xv.

Infusum. ʒi.—ii.

Tinctura. ℥^{xxx.}—ʒii.

SEDATIVE.

Antimonii Oxidum. gr. i.—iii.

Pulvis Antimonialis. gr. ii.—vi.

Antimonium Nigrum.

Antimonium Sulphuratum. gr. i.—v.

Antimonium Tartaratum. gr. $\frac{1}{16}$ — $\frac{1}{8}$.

Vinum Antimoniale. ℥ x.—ʒi.

Ipecacuanha.

Vide "Expectorants," &c.

Pulvis Ipecacuanhae Compositus. gr. v.—xv.

1. Write a formula for a mixture to contain Minererus' Spirit, Antimonial Wine, Syrup of Saffron, and Camphor Water.

R

Liquoris Ammoniae Acetatis, ʒii.

Vini Antimonialis, ʒiss.

Syrupi Croci, ʒi.

Aqua Camphorae, ʒiii.

Misce. Fiat mistura. Capiat cochlearia duo magna tertii horis.

Liquor ammoniae acetatis, if given in too large doses, will act as a diuretic, and not as a diaphoretic. A mixture of sweet spirit of nitre with it forms a very useful combination.

2. Prescribe a mixture to consist of Citrate of Ammonia and Serpentary.

R

Liquoris Ammoniae Citratis, ʒii.

Syrupi Limonis, ʒvi.

Tincturæ Serpentariæ, ʒii.

Infusi Serpentariæ, ʒiii.

Misce. Fiat mistura. Capiat cochlearia duo magna secundoris.

The combination of the tincture and infusion of serpentary in the foregoing prescription will serve to illustrate the fact that we may frequently obtain a more certain effect by combining different preparations of the same substance.

3. Write a prescription for pills each to contain two and a half grains of "James's Powder" and the same proportion of "Dover's Powder."

℞

Pulveris Antimonialis, gr. xv.

Pulveris Ipecacuanhæ Compositi, gr. xv.

Confectionis Rosæ, quantum sufficit ut fiat massa, in pilulas sex dividenda e quibus sumantur duæ vel tres omni nocte.

4. Prescribe pills of Opium, Ipecacuanha, and Camphor.

℞

Pulveris Opii, gr. i.

Pulveris Ipecacuanhæ, gr. i.

Camphoræ, gr. ii.

Spiritus Vini Rectificati, m.i.

Fiat pilula, horâ somni sumenda.

Ipecacuanha and camphor both increase the dia-phoretic action of opium.

5. Prescribe the Ammoniated Tincture of Guaiacum.

℞

Tincturæ Guaiaci Ammoniatæ, 3iv.

Mucilaginis Acaciæ, 3iv.

Tere simul, et adde

Infusi Senegæ, 3ii.

Misce. Fiat mistura. Capiat cochleare magnum bis in die.

Ammoniated tincture of guaiacum, being one of those which are precipitated by aqueous fluids, requires to be emulsified.

6. Write a formula to represent the "Chelsea Pensioner's Mixture."

R

Resinæ Guaiaci, ʒiv.
 Potassæ Tartratis Acidæ, ʒi.
 Sulphuris Sublimati, ʒii.
 Pulveris Rhei, ʒi.
 Pulveris Zingiberis, ʒiv.
 Pulveris Myristicæ, ʒii.
 Mellis quantum sufficit ut fiat electuarium, de quo capiat cochlearia duo parva nocte et mane.

DIURETICS.

Medicines which promote the secretion of the urine by increasing the function of the kidneys.

Some diuretics act *directly* on the secreting structure of the gland, others act *indirectly*.

The following are the chief therapeutic applications of diuretics.

1. To increase the flow of urine when it is deficient in quantity.
2. To eliminate poisons from the blood.
3. To diminish irritation of the genito-urinary organs.
4. To prevent the deposition of calculi or gravel in the urinary passages.

Whenever a diuretic effect is desired, the surface of the body should be kept cool, and purging should be carefully avoided.

The following are the chief diuretics :—

Ætheris Nitrosi Spiritus. mxxx.—ʒii.

Buchu Folia, gr. xx.—xl.

Infusum. ʒi.—ii.

Tinctura. ʒi.—ii.

Cantharis.

Tinctura. ℥v.—xx.*Digitalis.* gr. $\frac{1}{2}$ —ii.*Digitalinum.* gr. $\frac{1}{2}$ — $\frac{1}{2}$.*Infusum.* 3ii.—iv.*Tinctura.* ℥x.—xxx.*Juniperi Oleum.* ℥i.—iii.*Spiritus.* ℥xxx.—3i.*Pareiræ Radix.* gr. xxx.—3i.*Decoctum.* 3i.—ii.*Extractum.* gr. x.—xx.*Extractum Pareiræ Liquidum.* ℥xxx.—3ii.*Potassæ Acetas.* gr. x.—xx.*Potassæ Tartras Acida.* gr. xx.—3i.*Potassæ Nitras.* gr. v.—xx.*Scillæ.* gr. i.—ii.*Acetum.* ℥xv.—xl.*Oxymel.* ℥xxx.—3i.*Pilula Scillæ Composita.* gr. v.—x.*Syrupus.* ℥xxx.—3i.*Tinctura.* ℥xv.—xxx.*Senegæ Radix.* gr. xv.—xx.*Infusum.* 3i.—ii.*Tinctura.* ℥xxx.—3ii.*Scoparii Cacumina.**Decoctum.* 3ii.—iv.*Succus.* 3i.—ii.*Sodæ Acetas.* gr. x.—3i.*Sodæ Biboras.* gr. v.—xxx.*Mel Boracis.**Glycerinum Boracis.* 3i.—ii.*Terebinthinæ Oleum.* ℥x.—xxx.*Terebinthina Canadensis.* gr. x.—xxx.*Uvæ Ursi Folia.* gr. x.—xxx.*Infusum.* 3i.—ii.

i. Order a mixture to contain Acetate of Potash and Digitalis.

By

Potassæ Acetatis, 3i.*Tincturæ Digitalis,* 3i.*Infusi Digitalis,* 3iss.

Aquaæ Menthæ Piperitæ ad 3vi.
Misce. Fiat mistura. Capiat cochlearia duo magna tertiatâ quâque horâ.

This prescription illustrates the fact, to which allusion has already been made, that a combination of different preparations of the same substance enhances its efficacy.

Digitalis has a *cumulative* action, a fact which must be carefully remembered when administering that drug. Patients under the full influence of digitalis are only safe in the horizontal posture.

2. Write a formula for a draught to contain Squill, Broom, and Senega.

R

Tincturæ Scillæ, m_l xv.
Succi Scoparii, 3i.
Infusi Senegæ, 3ii.
Misce. Fiat haustus ad urinam movendam.

The above will be found an excellent combination. Senega resembles digitalis in its action, and may frequently be substituted for, or given alternately with, that drug, with excellent results.

3. Write a prescription for pills to contain Digitalis, Squill, and Calomel.

R

Pulveris Digitalis, gr. vi.
Pulveris Scillæ, gr. xii.
Pulveris Cretæ Aromatici, gr. xxiv.
Hydrargyri Subchloridi, gr. xii.
Confectionis Rosæ Gallicæ, quantum sufficit ut fiat massa, in pilulas duodecim dividenda. Sumat unam sextâ quâque horâ.

This is an imitation of "Baly's Pill."

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4. Prescribe a mixture of Acetate of Potash, Squill, and Broom.

R

Potassæ Acetatis, 3iss.

Aceti Scillæ, 3iv.

Decocti Scoparii ad 3vi.

Misce. Fiat mistura. Capiat cochlearia duo magna quartis horis.

It will at once be seen that the *Acetum Scillæ* is the most eligible preparation of squill for combination with acetate of potash.

5. Prescribe a mixture to contain Sweet Spirit of Nitre, a Diuretic Salt of Potash, and Broom.

R

Spiritus Ætheris Nitrosi, 3ii.

Potassæ Nitratis, gr. xx.

Decocti Scoparii, 3iv.

Misce. Fiat mistura, cujus capiat unciam quater in die.

The student will readily recognise the propriety of prescribing the *nitrate* of potash with the sweet spirit of nitre.

EMETICS.

Medicines which cause vomiting. Emetics are termed *Direct* when they affect the mucous membrane of the stomach and cause reflex or eccentric vomiting. *Indirect* emetics are those which affect the nerve-centres and produce centric emesis. The former do not require to be absorbed, and hence act more promptly.

Emetics may also be divided into *Stimulating*, as carbonate of ammonia and mustard, and *Depressing*, as tartar emetic and ipecacuanha. The degree of

muscular relaxation produced by an emetic is proportional to the amount of nausea which it creates.

The chief therapeutic applications of emetics are :—

1. To unload the stomach.
2. To dislodge substances from the respiratory passages, as in bronchitis and croup.
3. To relieve portal and hepatic congestion not dependent on organic disease.
4. To produce relaxation.
5. To reduce inflammation, as in the early stages of acute bronchitis.

Emetics should be used with great caution in cases where there is a tendency to determination of blood to the head, in disease of the heart and larger vessels, in hernia, in advanced pregnancy, and in prolapsus uteri. Emetics are also contra-indicated in gastric inflammation.

As a rule emetics should be given in a full dose; but when protracted nausea is required the dose must be small and frequently repeated. The action of emetics is assisted by drinking tepid water.

The emetics in most frequent use are :—

Ammoniæ Carbonas. gr. xxx., *well diluted.*

Antimonium Tartaratum. gr. i.—iii.

Vinum. 3*iv.*—3*i.*

Cupri Sulphas. gr. v.—viii.

Ipecacuanha. gr. xv.—xxx.

Vinum. 3*iii.*—vi.

Sinapis. *A teaspoonful to a tablespoonful.*

Sodii Chloridum. *A tablespoonful or more.*

Zinci Sulphas. gr. x.—xxx.

1. Prescribe a mixture of Tartar Emetic to produce emesis.

R

Antimonii Tartarati, gr. viii.

Aquæ puræ, ʒviii.

Misce. Fiat mistura. Capiat cochlearia duo magna subinde donec supervenerit vomitio.

When tartar emetic is given merely as a nauseant it should be combined with compound tincture of lavender, which has the property of restraining its emetic properties.

2. Write a prescription for a depressing emetic draught to consist of Tartar Emetic and Wine of Ipecacuanha.

R

Antimonii Tartarati, gr. i.

Vini Ipecacuanhæ, ʒii.

Aquæ puræ ad ʒiss.

Misce. Fiat haustus emeticus, statim sumendus.

When powerful emetics are combined we must be careful to administer a small dose of each lest the effect produced by the combination be excessive.

3. Prescribe a stimulating emetic draught of Carbonate of Ammonia.

R

Ammoniæ Carbonatis, gr. xxx.

Aquæ, ʒii.

Misce. Fiat haustus vomitum excitare.

Carbonate of ammonia when given as an emetic should be well diluted.

4. Prescribe a stimulating emetic draught of Mustard.

R

Sinapis, ʒi.

Aquæ tepidæ, ʒxvi.

Misce. Fiat haustus emeticus, statim sumendus.

Warm water aids the emetic action of mustard.

5. Prescribe an Emetic for a case of narcotic poisoning.

R

Zinci Sulphatis, gr. xxx.

Aqua, 3*iii.*

Misce. Fiat haustus emeticus, statim sumendus.

We prefer sulphate of zinc to sulphate of copper in cases of narcotic poisoning, because if the latter salt does not produce a speedy vomiting it may act as an irritant poison. If the stomach be paralysed by the narcotic, the administration of sulphate of copper would be extremely inadvisable.

EMMENAGOGUES.

Excitants of the catamenial flux. *Ecbolics* are substances which cause contraction of the uterus.

Emmenagogues are divided into *Direct*, those which act on the uterus, and *Indirect*, those which act through the system. The iron salts, aloes, colocynth, and other strong purgatives are examples of the latter class.

DIRECT EMMENAGOGUES.

Crocus. gr. x.—lx.

Tinctura. m*xxx.*—3*i.*

Ergota. gr. xx.—xxx.

Extractum Ergotæ Liquidum. m*x.*—3*l.*

Infusum. 3*i.*—ii.

Tinctura. m*x.*—3*i.*

Ruta. gr. xx.—xl.

Oleum. m*ii.*—vi.

Sabina. gr. iv.—x.

Oleum. m*i.*—v.

Tinctura. m*xx.*—3*l.*

ECBOLICS.

Digitalis.

Digitalinum }
Infusum }
Tinctura } *Vide "Diuretics."*

Ergota.

Sabina. gr. iv.—x.

Sodæ Biboras.

Glycerinum Boracis }
Mel Boracis } *Vide "Diuretics."*

1. Prescribe Ergot and Aloes for amenorrhœa from atony of the uterus.

R

Tincturæ Ergotæ, 3ii.

Decocti Aloes Compositi ad 3viii.

Misce. Fiat mistura, de quâ capiat cochlearia duo magna bis in die.

The indirect emmenagogues are often advisedly combined with those which act directly on the uterus.

2. Prescribe a mixture of Borax and Ergot.

R

Sodæ Biboratis, 3ii.

Tincturæ Ergotæ, 3ii.

Syrupi Croci, 3i.

Aquaæ Cinnamomi ad 3vi.

Misce. Fiat mistura. Capiat cochlearia duo magna sextis horis.

Dr. C. Brown of Pennsylvania, in a recent paper, speaks highly of a combination of ergot and borax.

3. Prescribe Ergot for a case of labour.

R

Pulveris Ergotæ, 3i.

Sacchari, 3iv.

Aquaæ Bullientis, 3iii.

Misce. Capiat cochlearia duo magna quartâ parte horæ ad effectum.

EMOLLIENTS.

These soften the part to which they are applied, and diminish acrimony. We will refer at greater length to this class of therapeutic agents when we come to consider "External Applications."

The following substances exert an emollient or demulcent action.

Acacisæ Gummi. *Ad libitum.*

Mucilago. 3i.—iv.

Adeps Præparatus.

Adeps Benzoatus.

Unguentum Simplex.

Amygdala Amara.

Amygdala Dulcis.

Mistura. 3i.—ii.

Pulvis Amygdalæ Compositus. 3i.—ii.

Amygdalæ Oleum. 3ii.—iv.

Amylum.

Glycerinum.

Mucilago.

Cera Alba.

Cera Flava.

Unguentum.

Cetaceum.

Unguentum.

Collodium.

Farina Tritici.

Ficus.

Glycerinum. mxxx.—3ii.

Glycyrrhizæ.

Extractum. gr. x.—xxx.

Extractum Glycyrrhizæ Liquidum. 3i.

Pulvis Glycyrrhizæ Compositus. gr. xxx—3i.

Hemidesmi Radix.

Syrupi. 3i.—ii.

Hordeum Decorticatum.

Decoctum. *Ad libitum.*

Lini Semina.

Infusum. Ad libitum.

Lini Farina.

Cataplasma.

Lini Oleum.

Mel.

Mel Depuratum.

Olivæ Oleum. $\frac{3}{i}$.—iv.

Ovi Albumen.

Saccharum Purificatum.

Syrupus.

Saccharum Lactis.

Sevum Præparatum.

Tragacantha. gr. xx. *upw.*

Mucilago. $\frac{3}{i}$. *up.*

Pulvis Tragacantha Compositus. gr. xx.—3.

One or two examples of formulæ for demulcents for internal use will suffice.

1. Prescribe a Demulcent Mixture to allay irritation from troublesome cough.

R

Extracti Glycyrrhizæ Liquidi, $\frac{3}{ss}$.

Syrupi Hemidesmi, $\frac{3}{i}$.

Mucilaginis Tragacanthæ, $\frac{3}{i}$.

Infusi Lini ad $\frac{3}{viii}$.

Misce. Fiat mistura. Capiat cochleare magnum tussi urgenti.

2. Prescribe a Demulcent Mixture for a case of ardor urinæ.

B

Tincturæ Hyoscyami, $\frac{3}{iii}$.

Mellis, $\frac{3}{v}$.

Mucilaginis Acaciæ, $\frac{3}{i}$.

Decocti Hordei, $\frac{3}{vi}$.

Misce. Fiat mistura. Capiat cochlearia duo magna subindè.

EXPECTORANTS.

Agents which affect the pulmonary mucous membrane, and which increase or alter the character of its secretion.

Expectorants are divided into *Stimulant* and *Sedative*. The former are contra-indicated in cases attended with febrile disturbance.

STIMULATING EXPECTORANTS.

Ammoniacum. gr. x.—xx.
Mistura. 3iv.—3i.

Ammoniæ Liquor. m_x .—xxx.

Ammoniæ Carbonas. gr. iii.—x.
Spiritus Ammoniæ Aromaticæ. m_{xxx} .—3i.

Ammonii Chloridum. gr. v.—xx.

Balsamum Peruvianum. m_x .—xv.

Balsamum Tolutanum. gr. x.—xx.

Syrupus. 3i.

Tinctura. m_{xxx} .—3ii.

Benzoinum. gr. x.—xxx.

Acidum Benzoicum. gr. x.—xv.

Tinctura Benzoini Composita. m_{xxx} .—3i.

Copaiba. m_{xxx} .—3i.

Copaibæ Oleum. m_v .—xx.

Laricis Cortex.

Tinctura. m_{xx} .—xxx.

Myrrha. gr. x.—xxx.

Pilula Aloes et Myrrhae. gr. v.—x.

Tinctura. m_{xxx} .—3i.

Pix Liquida. m_x .—3i.

Scilla. gr. i.—iii.

Acetum. m_{xv} .—xl.

Oxymel. 3i.—ii.

Pilula Ipecacuanhae cum Scilla. gr. v.—x.

Pilula Scillaæ Composita. gr. v.—x.

Syrupus. m_{xxx} .—3i.

Tinctura. m_x .—xxx.

Senegæ Radix. gr. xx.—3*i.*

Infusum. 3*i.*—ii.

Tinctura. ℥_{xxx}.—3*ii.*

Styrax Præparatus. gr. v.—xx.

SEDATIVE EXPECTORANTS.

Antimonii Oxidum. gr. i.—v.

Pulvis Antimonialis. gr. iii.—xv.

Antimonium Tartaratum. gr. $\frac{1}{2}$ — $\frac{1}{4}$.

Vinum Antimoniale. ℥_x.—3*i.*

Ipecacuanha. gr. $\frac{1}{2}$ —ii.

Pilula Ipecacuanha cum Scillæ. gr. v.—x.

Pulvis Ipecacuanha Compositus. gr. v.—xv.

Trochisci. 1—3.

Lobelia.

Vinum. ℥_v.—xl.

Tinctura. ℥_x.—xxx.

Tinctura Lobelia Ætherea. ℥_x.—xxx.

Vapour of water, of chlorine, of ammonia, of iodine, of creasote, and of carbolic acid may be classed under Expectorants. Substances coming under the denomination of "Pulmonary Sedatives" will be referred to hereafter.

1. Prescribe a stimulating expectorant mixture to consist of Carbonate of Ammonia, Squill, Tolu, and Senega.

R.

Ammoniæ Carbonatis, gr. xl.

Tincturæ Scillæ, 3*ii.*

Syrupi Tolutani, 3*ii.*

Infusi Senegæ, 3*vii.*

Misce. Fiat mistura. Capiat cochlearia duo magna quartâ quâque horâ.

Carbonate of ammonia should not be prescribed with *syrup* of squill, as this preparation contains acetic acid and decomposes the salt.

Squill may be very advantageously combined with ipecacuanha and ammoniacum.

2. Prescribe a mixture containing Benzoic Acid.

B

Acidi Benzoici, 3*i.*
 Glycerini Boracis, 3*i.*
 Infusi Senegæ, 3*vii.*

Misce. Fiat mistura. Sunat cochlearia duo magna quartis horis.

Benzoic acid should be administered in a large quantity of aqueous vehicle to prevent irritation of the fauces. Borax or phosphate of soda greatly increases its solubility. If it be desirable to administer the benzoic acid in pill, it will be well to remember that one minim of glycerine makes a good mass with five grains of the acid. When the compound tincture of benzoin is given internally it should be suspended by means of mucilage or yoke of egg.

3. Write a prescription for a child threatened with croup.

B

Vini Ipecacuanhæ, 3*iii.*
 Syrupi Tolutani, 3*v.*
 Mucilaginis Acaciæ, 3*i.*

Misce. Fiat mistura. Capiat cochleare parvum omni horâ vel secundâ quâque horâ.—*Cheyne.*

4. Prescribe Lobelia and Stramonium for a case of asthma.

B

Tincturæ Lobeliæ Æthereæ, 3*ii.*
 Tincturæ Stramonii, 3*ii.*
 Spiritus Chloroformi, 3*iv.*
 Aquæ Camphoræ, 3*vii.*

Misce. Fiat mistura, cuius capiat cochleare magnum quartâ quâque horâ.

Lobelia varies greatly in its effects on individuals;

hence it is a good rule always to commence its administration by small doses.

5. Prescribe pills of Tar.

R

Picis Liquidæ, m. xxxvi.

Pulveris Glycyrrhizæ, gr. q. s.

Fiat massa in pilulas duodecim dividenda è quibus capiat tres ter in die.

NARCOTICS.

Narcotics are medicines whose action on the nervous system is manifested by alleviation of pain (*Anodynes*), or by induction of sleep (*Soporifics* or *Hypnotics*).

Narcotics do not all exert a similar action ; some, as opium and Indian hemp, are capable of producing a powerful stimulant effect if administered in small and frequently-repeated doses.

Idiosyncrasy, habit, and age should be carefully considered with reference to the administration of narcotics. Some individuals are peculiarly susceptible to their action. The activity of this class of drugs is greatly diminished by the frequency of their exhibition. The young are much more impressible than are adults by narcotics.

SOPORIFICS AND ANODYNES.

Ammonii Bromidum. gr. ii.—xx.

Cannabis Indica.

Extractum. gr. $\frac{1}{2}$ —i.

Tinctura. m. v.—xx.

Chloral Hydras. gr. v.—xxx.

Lactuca.

Extractum. gr. v.—xv.

Lupulus.

Extractum. gr. v.—xv.*Infusum.* ʒi.—ii.*Tinctura.* ℥xxx.—ʒii.

Opium. gr. ¼—iii.

Confectio. gr. v.—xx.*Emplastrum.**Enema.**Extractum.* gr. ¼—iii.*Extractum Opii Liquidum.* ℥iv.—xl.*Linimentum.**Pilula Saponis Composita.* gr. iii.—v.*Pilula Plumbi cum Opio.* gr. iv.—viii.*Pilula Ipecacuanha cum Scilla.**Pulvis Cretæ Aromaticus cum Opio.* gr. x.—ʒi.*Pulvis Ipecacuanha Compositus.* gr. v.—xv.*Pulvis Kino Compositus.* gr. v.—xx.*Pulvis Opii Compositus.* gr. ii.—v.*Tinctura Opii.* ℥iv.—xl.*Tinctura Camphoræ Composita.* ℥xv.—ʒi.*Tinctura Opii Ammoniata.* ℥xxx.—ʒi.*Trochisci Opii.* 1—4.*Unguentum Gallæ cum Opio.**Vinum Opii.* ℥iv.—xl.*Morphiæ Hydrochloras.* gr. ½—i.*Liquor.* ℥x.—ʒi.*Suppositoria.**Trochisci.* 1—4.*Trochisci Morphiæ et Ipecacuanha.**Morphiæ Acetas.* gr. ½—i.*Liquor.* ℥x.—ʒi.*Injectio Morphiæ Hypodermica.* ℥i.—vi. *subcutaneously.*

Papaveris Capsulæ.

Decoctum. ʒi.—ii.*Extractum.* gr. ii.—v.*Syrupus.* ʒi.*Potassii Bromidum.* gr. v.—xxx.*Digitalis sometimes induces sleep from its action on the circulation.*

ANODYNES AND ANTISPASMODICS.

Aconiti Folia. gr. ii.—x.*Extractum.* gr. i.—ii.

Aconiti Radix.

*Linimentum.**Tinctura.* ℥v.—xv.*Aconitia.**Unguentum.*

Belladonnæ Folia.

Extractum. gr. $\frac{1}{2}$ —i.*Emplastrum.**Tinctura.* ℥v.—xv.*Succus.* ℥v.—xv.*Unguentum.*

Belladonnæ Radix.

*Linimentum.**Atropia.**Liquor.**Unguentum.**Sulphas.**Liquor.*

Conii Folia. gr. ii.—viii.

*Cataplasma.**Extractum.* gr. ii.—vi.*Pilula Conii Composita.* gr. v.—x.*Succus.* ℥xxx.—3i.*Vapor.*

Conii Fructus.

Tinctura. ℥xx.—3ii.

Hyoscyami Folia.

Extractum. gr. v.—x.*Succus.* ℥xxx.—3i.*Tinctura.* ℥xxx.—3i.

Stramonii Folia. gr. i., upwards.

Stramonii Semina.

Extractum. gr. $\frac{1}{2}$ — $\frac{1}{2}$.*Tinctura.* ℥x.—xxx.

i. Prescribe a draught containing Indian Hemp.

R

Tincturæ Cannabis Indicæ, ℥xv.*Mucilaginis Acaciae,* 3ii.*Aquæ Camphoræ ad 3iss.**Misce.* Fiat haustus, tertiiis horis repetendus donec dolor mitescat.

The tincture of Indian hemp is decomposed by water, and hence it must be suspended in aqueous fluids by means of mucilage; the addition of a few drops of alkaline fluid, as aromatic spirit of ammonia, will also keep it in solution.

2. Prescribe Lupuline.

R

Lupulinæ, gr. viii.

Extracti Lupuli, quantum sufficit ut fiat massa. Fiant pilulæ duæ horâ somni sumendæ.

Lupuline is best administered in the form of pill.

3. Order Hydrochlorate of Morphia in doses equivalent to one grain of opium.

R

Morphiæ Hydrochloratis, gr. i.

Sacchari Lactis, gr. xvi.

Extracti Glycyrrhizæ quantum sufficit ut fiat massa, in pilulas octo dividenda. Capiat unam omni nocte.

The following may be reckoned as therapeutical equivalents: 1 gr. Hydroch. Morph. = 8 gr. Opium = 4 gr. Ext. Opium = 93m Tinct. Opium.—*Squire.*

4. Prescribe Opium and Belladonna in combination.

R

Pulveris Opii, gr. iv.

Extracti Belladonnæ, gr. i.

Extracti Hyoscyami, gr. xvi.

Misce. Fiat massa, divide in pilulas quatuor. Capiat unam quartâ quâque horâ.

The above formula will be found useful where it is necessary to relieve severe pain. Belladonna increases the hypnotic effects.

prevents the constipation produced by that drug. I may here quote a recent admirable paper by Prof. Bartholow of Cincinnati on the combined administration of morphia, atropia, and chloral. (a) He says, "In man the excitant action of atropia hinders the occurrence of chloral narcosis, but rather deepens the sopor when it at last supervenes. The effects of atropia last much longer, and are apparently in no way prevented by chloral. Morphia deepens in every way the effects of chloral. Many of the unpleasant effects of morphia are modified as regards the wakefulness caused by the latter, but are not modified as regards the subsequent nausea, vomiting, headache, vertigo, and constipation. When the two agents are administered conjointly a much less quantity of chloral is necessary in order to produce sleep. These agents act much more favourably when administered simultaneously. Chloral causes sleep; morphia relieves pain; atropia prevents or lessens the depression in the respiration and cardiac movements caused by the other two, while it contributes to their cerebral effects.

"These physiological studies are confirmed by therapeutical results. The combination of chloral, morphia, and atropia is adapted to those cases of insomnia caused by pain, or in which chloral or morphia alone merely increases the cerebral excitement, as in hypochondria, puerperal mania, &c. This combination is also indicated in cases of fatty and irritable heart. When pain is to be relieved, chloral is not so serviceable as the combination with morphia and atropia."

5. Prescribe pills of Belladonna, Camphor, and Henbane.

R

Extracti Belladonnæ, gr. iii.

Camphoræ, gr. xii.

Extracti Hyoscyami, gr. xv.

Misce. Fiant pilulæ sex, quarum sumat unam horâ decubitus.

The administration of belladonna should be discontinued when the patient begins to complain of thirst.

6. Order a draught to contain Tincture of Henbane and Carbonate of Potash.

R

Tincturæ Hyoscyami, m_{xxx}.

Potassæ Carbonatis, gr. x.

Syrupi Papaveris, 3ii.

Aquæ Camphoræ ad 3iss.

Misce. Fiat haustus, horâ somni sumendus.

Solutions of caustic fixed alkalies are incompatible with belladonna, henbane, and stramonium, but carbonates and bicarbonates of the alkalies may be combined with these drugs.

7. Prescribe a sleeping draught for a case in which opium disagrees.

R

Tincturæ Hyoscyami, m_{xl}.

Potassii Bromidi, gr. x.

Syrupi Rhœados, 3ii.

Aquæ Camphoræ ad 3ii.

Misce, fiatque haustus, somno deficiente bibendus.

8. Prescribe pills containing Opium, so that the patient may not know he has been ordered that drug.

R

Pilulæ Saponis Compositæ, gr. iv.

Vespere ante somnum sumenda.

9. Order a narcotic mixture for an infant.

R

Tincturæ Opii, m.i. Misturæ Amygdalæ, f.i.

Misce. Fiat mistura. Capiat cochleare parvum bis terva in die.

As we have already stated, children are peculiarly susceptible to the action of narcotics; belladonna is, however, much better borne than opium by them.

REFRIGERANTS.

Agents which possess the property of reducing the sensation of abnormal heat of the body, and which are accordingly useful in allaying febrile disturbance. They are :—

Acetum. $\text{z.i.}-\text{ii.}$ Acidum Aceticum Dilutum. $\text{z.i.}-\text{ii.}$

Acidum Citricum. gr. x.—xxx.

Acidum Phosphoricum Dilutum. $\text{m.x.}-\text{xxx.}$

Acidum Tartaricum. gr. x.—xxx.

Ammoniæ Acetatis Liquor. $\text{z.ii.}-\text{vi.}$ Ammoniæ Citratis Liquor. $\text{z.ii.}-\text{vi.}$

Potassæ Chloras. gr. x.—xx.

Potassæ Nitræ. gr. v.—xx.

Potassæ Tartras Acida. gr. xx.—3.

Juices of acidulous fruits are also refrigerant, and are useful in allaying thirst.

One or two examples of refrigerant mixtures will suffice. We will hereafter consider formulæ for external refrigerant applications.

I. R

Liquoris Ammoniæ Citratis, z.iiiss. Acidi Citrici, z.i. Syrupi Limonis, z.iss. Aquaæ, z.iv.

Misce. Fiat mistura, de quâ sumantur cochlearia duo magna subindè.

2. R

Potassæ Nitratis, 3i.
 Acidi Nitrici Diluti, 3ii.
 Spiritus Ætheris Nitrosi, 3iv.
 Syrupi Croci, 3v.
 Aquæ, 3viss.

Misce. Fiat mistura. Capiat cochlearia duo magna ter quaterve in die.

SEDATIVES.

Sedatives are defined as medicines which primarily depress the vital powers, and whose action is unaccompanied by a stage of excitement.

They may be divided into the following groups:—

- I.—Pulmonary Sedatives.
- II.—Spinal Sedatives.
- III.—Stomachic Sedatives.
- IV.—Vascular Sedatives.

I.—PULMONARY SEDATIVES.

Substances which, however they may differ in their action in other respects, produce a direct sedative effect on the respiratory organs. The following may be enumerated:—

Acidum Hydrocyanicum Dilutum. mii.—viii.
 Belladonna
 Conium } *Vide "Narcotics."*
 Opium
 Plumbi Acetas. *Vide "Astringents."*
 Stramonium. *Vide "Narcotics."*
 Tabacum.

1. Write a formula for a mixture to contain Prussic Acid.

9.

R
T
M
Misc
die.

As we
suscept
however:

Agents
sensation
are accordi
They are :-

Acetum.
Acidum A.
Acidum Ci
Acidum Pho
Acidum Tart
Ammoniae Ac
Ammoniae Cit
Potasse Chlor.
Potasse Nitras.
Potasse Tartras

Juices of acidul
are useful in allaying

One or two exam.
suffice. We will her
ternal refrigerant appli

I. R

Liquoris Ammoniae Citr.
Acidi Citri, 3i.
Syrapi Limonis, 3ss.
Aque, 3iv.

Diss. (E. P.), 17xx

Liquor cochlearia duo magna tussi

should generally be prescribed in the
as when given in mixture with thin
nocturnal or the top and a poisonous dose
use. By adapting almond mixture as
giving the direction to shake the bottle,
it is avoided.

After the acid in the prescription
is the pharmaceutical acid, the strength
is intended, and not Scheele's
acid, per cent.

for a mixture to contain
and Ipecacuanha.

Liquor cochlearia duo magna tussi

can often be combined advan
speciments.

NATURALS.

in function of the spinal

conditions of the
actions, and in over

Ammonii Bromidum, gr. ii.—iii.

Comii Folia, gr. ii.—vii.

Convolvulus.

Extractum, gr. ii.—vi.

Pilule Comii Composite, gr. vii.—x.

Succus Myrra, 1*ij.*

Vader.

Comii Fructus.

Tinctura Myrra, 1*ij.*

Physostigmatis Folia, gr. i.—iv.

Extractum, gr. ii.—v.

Potassii Bromidum, gr. v.—viii.

Acidum hydrocyanicum acts on the whole nervous system, not specially on the spinal cord.

1. Prescribe pills of Calabar Bean and Hemlock.

B

Extracti Physostigmatis, gr. ii.

Pilule Comii Composite, gr. iiii.

Misce, Fiant pilule saepe. Sunt enim sentis horis.

In making up the foregoing prescription, great care should be taken that the ingredients be thoroughly and equably incorporated; this, however, is more a matter for the dispenser than for the prescriber.

2. Write the formula for a draught to contain Bromide of Ammonium, Sal Volatile and Valerian.

B

Ammonii Bromidi, gr. x.

Spissis Ammoniae Aromaticae, 1*ij.*xx.

Tinctura Valeriana Anomotata, 1*ij.*xx.

Aqua Camphorae, 5*ss.*

Misce. Fiat haustus, his terre die sumendum.

The ammoniated tincture of valerian is, of course, preparation best suited for combination with ingredients in this prescription.

R

Acidi Hydrocyanici Diluti (B. P.), m_{xii} .
 Misturæ Amygdalæ, $\mathfrak{z}vi$.
 Misce. Fiat mistura. Capiat cochlearia duo magna tussi
 admodum ingravescente.

Prussic acid should generally be prescribed in the form of draught, as when given in mixture with thin fluids it is apt to float on the top and a poisonous dose may thus be taken. By adapting almond mixture as the vehicle, and giving the direction to shake the bottle, this danger may be avoided.

The letters (B. P.) after the acid in the prescription are to signify that the pharmacopœial acid, the strength of which is 2 per cent., is intended, and not Scheele's acid, which contains 4 per cent.

2. Write a prescription for a mixture to contain chiefly Stramonium and Ipecacuanha.

R

Vini Ipecacuanhæ, $3ss$.
 Tincturæ Stramonii, $3i$.
 Syrupi Papaveris, $\mathfrak{z}i$.
 Decocti Hordei, $\mathfrak{z}v$.
 Misce. Fiat mistura. Capiat cochlearia duo magna tussi
 urgente.

Pulmonary sedatives may often be combined advantageously with depressing expectorants.

II.—SPINAL SEDATIVES.

Substances which impair the function of the spinal cord.

They are indicated in irritated conditions of the spinal cord, in spasmotic affections, and in over excitement of the organs of generation. They are:—

—

—

—"

—"

Antacids."

—"

rium for vomiting of

—rum capiat unam bis in

given in the form of

tion with a bitter

atis, 3iv.

earia duo magna ter

— citratis is the
of bismuth which
ed with alkalies

3. Prescribe Bromide of Potass and Henbane.

R

Potassii Bromidi, 3*i.*
Succi Conii,
Succi Hyoscyami, $\frac{a}{a}$ 3*ii.*
Aquæ Camphoræ, $\frac{3}{5}$ *vi.*
Misce. Fiat mistura, cujus sumat æger co quartâ quâque horâ.

During the exhibition of hemlock the physiological effects, *e.g.* giddiness and be carefully watched for.

The combination of hemlock with belladonna, henbane or opium, intensifies these drugs.

III.—STOMACHIC SEDATIVES.

Medicines which allay irritation of the stomach. Some, as prussic acid, alkaline preparations of bismuth and silver, &c., act by exerting a sedative effect on the mucous membrane; belladonna, stramonium, hyoscyamus, and opium through the central nervous system.

Stomachic sedatives are indicated in pain in the stomach and upper portions of the alimentary tract in pyrosis and vomiting.

They are:—

Acidum Carbolicum. *Vide* "Astringents."

Acidum Hydrocyanicum Dilutum. *Vide* "Pulmonary Sedatives."

Argenti Nitrás. gr. $\frac{1}{2}$ — $\frac{1}{2}$.

Argenti Oxidum. gr. $\frac{1}{2}$ —ii.

Belladonna. *Vide* "Narcotics."

Bismuthi et Ammoniæ Citratis Liquor.

Bismuthi Carbonas. gr. v.—xx.

Bismuthi Oxidum. gr. v.—xv.

Bismuthi Subnitras. gr. v.—xx.

Trochisci. 1—6.

Cerii Oxalas. gr. i.—ii.

Creasotum. *Vide* "Astringents."

Hyoscyamus } *Vide* "Narcotics."

Opium

Potassæ Bicarbonas

Potassæ Liquor

Sodæ Bicarbonas

Sodæ Liquor

Stramonium. *Vide* "Narcotics."

} *Vide* "Antacids."

1. Prescribe Oxalate of Cerium for vomiting of pregnancy.

R

Cerii Oxalatis, gr. xxiv.

Extracti Hyoscyami, gr. xxxvi.

Misce. Fiant pilulæ duodecim, quarum capiat unam bis in die.

Oxalate of cerium may also be given in the form of powder with sugar of milk, &c.

2. Prescribe Bismuth in solution with a bitter infusion.

R

Liquoris Bismuthi et Ammoniæ Citratis, 3iv.

Syrupi Aurantii, 3iv.

Infusi Calumbæ, 3v.

Misce. Fiat mistura. Sumantur cochlearia duo magna ter in die.

The liquor bismuthi et ammoniæ citratis is the only officinal soluble preparation of bismuth which we possess; it may not be prescribed with alkalies or their carbonates.

3. Prescribe Carbonate of Bismuth.

By

Bismuthi Carbonatis, gr. xv.
Sit pulvis, in cyatho lactis sumendus.

Milk is an excellent medium for the administration of the carbonate of bismuth. This salt and the sub-nitrate of bismuth may also be given suspended by mucilage in aqueous vehicles.

IV.—VASCULAR SEDATIVES.

Medicines which depress the action of the heart and vascular system. Some act chiefly on the heart, others act more especially on the smaller vessels and capillaries; they may therefore be divided into Cardiac and Capillary Sedatives. The former are indicated in cases in which it is desirable to moderate excessive action of the heart, the latter are useful in inflammations, haemorrhages, &c.

CARDIAC SEDATIVES.

- Acidum Hydrocyanicum Dilutum. ℥ii.—viii.
- Aconiti Radix.
 - Tinctura. ℥v.—xv.
 - Linimentum.
- Aconiti Folia.
 - Extractum. gr. i.—ii.
- Colchici Cormus. gr. ii.—viii.
 - Extractum. gr. $\frac{1}{2}$ —ii.
 - Extractum Colchici Aceticum. gr. $\frac{1}{2}$ —ii.
 - Vinum. ℥x.—xxx.
- Colchici Semen.
 - Tinctura. ℥x.—xxx.
- Digitalis. gr. $\frac{1}{2}$ —i $\frac{1}{2}$.
 - Infusum. 5ii.—iv.
 - Tinctura. ℥x.—xxx.

Physostigmatis Faba. gr. i.—iv.

Extractum. gr. $\frac{1}{16}$ — $\frac{1}{4}$.

Tabacum.

Enema.

CAPILLARY SEDATIVES.

Amyl Nitris. ℥ii.—v. *cautiously inhaled.*

Antimonii Oxidum. gr. i.—iii.

Pulvis Antimonialis. gr. v.—xv.

Antimonium Tartaratum. gr. $\frac{1}{2}$ —i.

Vinum Antimoniale.

Unguentum.

Ergota. gr. x.—xxx.

Extractum Ergotæ Liquidum. ℥x.—3*i.*

Infusum. $\frac{3}{2}$ *i.*—ii.

Tinctura. ℥x.—xx.

Ipecacuanha. gr. i.—ii.

Pilula Ipecacuanha cum Scilla. gr. v.—x.

Pulvis Ipecacuanha Compositus. gr. v.—xv.

Trochisci. 1—3.

Vinum. ℥v.—xl.

Plumbi Acetas. gr. $\frac{1}{2}$ —iii.

Pilula Plumbi cum Opio. gr. iv.—viii.

Suppositoria Plumbi Composita.

Unguentum.

Potassæ Nitras. gr. xx.—xxx.

i. Prescribe a mixture of Aconite.

R

Tincturæ Aconiti (B. P.), ℥xl.

Aquaæ Menthae Piperitæ, $\frac{3}{2}$ *iv.*

Misce. Fiat mistura. Capiat cochleare magnum sextis horis donec dolor mitescat.

During the administration of aconite, as of all vascular sedatives, symptoms of depression should be carefully watched for. It is well to give the drug in the simple form above indicated. "Fleming's Tincture of Aconite" is six times stronger than the officinal preparation, and it is hence advisable to specify that the latter is the tincture to be used.

2. Write a prescription for a mixture of which Green Hellebore and Ipecacuanha are to be the chief ingredients.

R

Tincturæ Veratri Viridis, mxxx.

Vini Ipecacuanhæ, 3*i.*

Syrupi Rhoeados, $\frac{3}{4}$ *l.*

Aquæ Camphoræ, ad $\frac{3}{4}$ *vi.*

Misce. Fiat mistura. Capiat cochlearia duo magna tertis horis.

We must of course cease the administration of the hellebore the moment symptoms of depression manifest themselves.

Examples of the mode of prescribing the other vascular sedatives have already been given. It may be mentioned here that the *wine* of tartar emetic is an unsuitable form of administration of that medicine when it is given for its depressant effect.

STIMULANTS.

Substances which temporarily augment the vital powers. They may be divided into the following groups :—

I.—Exhilarants.

II.—Spinal Stimulants.

III.—Stomachic Stimulants.

IV.—Vascular Stimulants.

I.—EXHILARANTS.

Substances which primarily influence the brain, causing transient exaltation of the spirits, and stimulation of the functions of the body.

They are indicated in low conditions of the nervous system and in cases in which temporary stimulation of the vascular system is required. The following are the chief Exhilarants :—

Alcohol, in various forms, as—

Spiritus Vini Gallici.

Mistura Spiritus Vini Gallici. 3*i.*—ii.

Vinum Xericum.

Æther. m_{xx} .—3*i.*

Spiritus Ætheris. m_{xxx} .—3*iss.*

Æther Aceticus. m_{xx} .—3*i.*

Cannabis Indica.

Extractum. gr. $\frac{1}{2}$.—i.

Tinctura. m_v .—xx.

Chloroformum. m_{iii} .—x.

Aqua. 3*i.*—ii.

Linimentum.

Spiritus. m_{xx} .—3*i.*

Tinctura Chloroformi Composita. m_{xx} .—3*i.*

Opium. *In small doses.*

1. Prescribe a draught to contain Ether incorporated with Infusion of Cloves.

B

Ætheris, 3*i.*

Cetacei, gr. ii.

Tere simul et gradatim adde

Infusi Caryophylli, ad 3*i.*

Misce. Fiat haustus, statim sumendus.

Ether may be easily incorporated with an aqueous vehicle by rubbing it up with spermaceti in the above proportions.

2. Prescribe a draught to consist of Hoffman's Anodyne, Chloric Ether and Peppermint Water.

B

Spiritus Ætheris, m_{xl} .

Spiritus Chloroformi, m_{xx} .

Aquæ Menthæ Piperitæ, $\frac{3}{i}$.

Misce. Fiat haustus, statim sumendus, et repetatur quartâ parte horæ.

3. Write a formula for a mixture to contain Indian Hemp.

R

Tincturæ Cannabis Indicæ, $\frac{3}{i}$.

Mucilaginis Acaciæ, $\frac{3}{i}$.

Syrupi Zingiberis, $\frac{3}{ss}$.

Aquæ Menthæ Piperitæ, ad $\frac{3}{vi}$.

Misce. Fiat mistura. Capiat cochlearia duo ampla quartâ quâque horâ.

The tincture of cannabis indica is one of those which require to be suspended by mucilage.

II.—SPINAL STIMULANTS.

Substances which stimulate the functions of the spinal cord. They are indicated in some cases of paraplegia unaccompanied by inflammation, in chronic hemiplegia, in local paralysis and in functional debility of the cord.

They are :—

Arnica.

Tinctura. m_{xxx} .— $\frac{3}{i}$.

Belladonna. *Vide* "Narcotics."

Cannabis Indica.

Extractum. gr. $\frac{1}{4}$.—i.

Tinctura. gr. v.—xx.

Cantharides. *Vide* "Diuretics."

Ergota. *Vide* "Emmenagogues."

Nux Vomica. gr. i.—iii.

Extractum. gr. $\frac{1}{4}$.—ii.

Tinctura. m_x .—xx.

Strychnia. gr. $\frac{1}{30}$.— $\frac{1}{2}$.

Liquor. m_v .—x.

Opium. *Vide* "Narcotics."

Phosphorus. gr. $\frac{1}{10}$ — $\frac{1}{10}$.

Oleum Phosphoratum. ℥v.—x.

Pilula Phosphori. gr. iii.—vi.

1. Write a formula for a mixture to contain chiefly Arnica and Belladonna.

R

Tincturæ Arnicæ, ʒii.

Tincturæ Belladonnæ, ℥xxx.

Spiritus Chloroformi, ℥xxx.

Aquæ Camphoræ, ad ʒiv.

Misce. Fiat mistura, de quâ sumantur cochlearia duo magna tertii horis.

2. Prescribe pills of Nux Vomica and Ergot.

R

Extracti Nucis Vomicæ, gr. vi.

Pulveris Ergotæ, gr. xxiv.

Extracti Glycyrrhizæ, quantum sufficit ut fiat massa, in pilulas sex dividenda, è quibus capiat tres in dies.

3. Prescribe Phosphorus in a fluid form.

R

Phosphori, gr. i.

Olei Morrhuae, ʒiv.

Solve bene. Capiat cochleare minimum bis in die.

When phosphorus is combined with vegetable oils it is liable to be converted into hypophosphorous acid, hence cod-liver oil is a more suitable medium for its administration. Phosphorus is soluble in ether, but the solution is liable to variation in strength owing to the evaporation of the ether; phosphorus when given thus is liable to form a coating on the tongue. In the recent "Additions" to the Pharmacopœia is a form for the preparation of pills of phosphorus. (a)

(a) For much valuable information regarding the mode of administration of phosphorus see J. Ashburton Thompson's 'Free Phosphorus in Medicine,' London, 1874.

III.—STOMACHIC STIMULANTS.

Medicines which act as stimulants to the mucous membrane of the stomach and intestines. They are indicated in cases of pain, spasm and flatulent distension, and are very generally employed to correct the griping properties of purgatives.

They may frequently be combined advantageously with stomachic tonics.

They are:—

Æther. m_{xx} .—3*i*.

Spiritus Ætheris. m_{xxx} .—3*iss*.

Æther Aceticus. m_{xx} .—3*i*.

Anethi Fructus.

Aqua. $\frac{3}{4}$ *i.*—ii.

Anethi Oleum. m_{ii} .—v.

Anisi Oleum. m_{i} .—v.

Essentia. m_x .—xx.

Armoraciæ Radix.

Spiritus Armoraciæ Compositus. $\frac{3}{4}$ *i.*—ii.

Cajeputi Oleum. m_i .—v.

Spiritus. m_{xxx} .—3*i*.

Capsici Fructus. gr. $\frac{1}{2}$ —i.

Tinctura. m_x .—xx.

Cardamomum. gr. v.—xx.

Tinctura Cardamomi Composita. m_{xxx} .—3*ii*.

Carui Fructus.

Aqua. $\frac{3}{4}$ *i.*—ii.

Carui Oleum. m_i .—v.

Caryophyllum. gr. v.—xx.

Infusum. $\frac{3}{4}$ *i.*—iv.

Caryophylli Oleum. m_i .—v.

Cinnamomi Cortex. gr. x.—xxx.

Aqua. $\frac{3}{4}$ *i.*—ii.

Pulvis Cinnamomi Compositus

Tinctura. m_{xx} .—3*ii*.

Cinnamomi Oleum. m_i .—v

Coriandri Fructus. gr. x.—xxx.

Coriandri Oleum. m_i .—v.

Foeniculi Fructus.

Foeniculi Fructus—

Aqua. $\frac{3}{5}$ i.—ii.

Menthæ Piperitæ Oleum. m_i .—v.

Aqua. $\frac{3}{5}$ i.—ii.

Essentia. m_{xx} .—xx.

Spiritus. m_{xxx} .— $\frac{3}{5}$ i.

Menthæ Viridis Oleum. m_i .—v.

Aqua. $\frac{3}{5}$ i.—ii.

Myristica. gr. v.—xv.

Myristicæ Oleum Expressum.

Myristicæ Oleum. m_i .—v.

Spiritus. m_{xxx} .— $\frac{3}{5}$ i.

Pimenta. gr. v.—xx.

Aqua. $\frac{3}{5}$ i.—ii.

Pimentæ Oleum. m_i .—v.

Piper Nigrum. gr. v.—x.

Confectio. $\frac{3}{5}$ i.—ii.

Sinapis.

Sinapis Oleum. m_i .—v.

Zingiber. gr. x.—xxx.

Syrupus. $\frac{3}{5}$ i.

Tinctura. m_{xv} .— $\frac{3}{5}$ i.

Tinctura Fortior. m_v .—xx.

1. Prescribe a mixture of Calumba and Cloves.

R

Tincturæ Calumbæ. $\frac{3}{5}$ i.

Syrupi Zingiberis. $\frac{3}{5}$ iv.

Infusi Caryophylli. $\frac{3}{5}$ viss.

Misce. Fiat mistura, de quâ sumantur cochlearia duo magna horâ post jentaculum totidemque horis duabus ante prandendum.

IV.—VASCULAR STIMULANTS.

Medicines which stimulate the action of the heart and vascular system.

Some act chiefly on the heart, others more especially on the smaller vessels and capillaries; they may accordingly divided into Cardiac and Capillary Stimulants. The former are indicated in cases in which

is required to excite the action of the heart, the latter are indicated in chronic inflammations when the circulation through the diseased part is languid.

CARDIAC STIMULANTS.

Æther. m_{xx} .—3*i.*

Spiritus. m_{xxx} .—3*iss.*

Alcohol in various forms.

Ammonia.

Ammoniæ Carbonatis. gr. iii.—x.

Spiritus Ammoniæ Aromaticus. m_{xxx} .—3*i.*

Camphora. gr. i.—x.

Aqua. 3*i.*—ii.

Linimentum.

Linimentum Camphoræ Compositum.

Spiritus. m_x .—xxx.

Tinctura Camphoræ Composita. m_{xv} .—3*i.*

Chloroformum. m_{iii} .—x.

Aqua. 3*i.*—ii.

Linimentum.

Spiritus. m_{xx} .—3*i.*

Tinctura Camphoræ Composita. m_{xx} . 3*i.*

Sumbul Radix. gr. xx.—3*i.*

Tinctura. m_x .—xxx.

Valerianæ Radix. gr. x.—xxx.

Infusum. 3*i.*—ii.

Tinctura. 3*i.*—ii.

Tinctura Valerianæ Ammoniata. m_{xxx} .—3*i.*

CAPILLARY STIMULANTS.

Ammoniæ Acetatis Liquor. 3*ii.*—vi.

Ammoniæ Citratis Liquor. 3*ii.*—vi.

Mezerei Cortex.

Extractum Mezerei Æthereum.

Sassafras.

Serpentariæ Radix. gr. x.—xx.

Infusum. 3*i.*—ii.

Tinctura. m_{xxx} .—3*ii.*

have already frequently studied examples of the of prescribing the foregoing medicines.

SPECIAL STIMULANTS, ALTERATIVES, OR SPECIFICS.

Medicines which exert a special action on the general system, or on certain organs, and which give rise to some alteration in vital action (*Alteratives*), or exert a special influence in certain diseases (*Specifics*).

They may be enumerated as follows.

Antimonial Preparations—

- Antimonii Oxidum. gr. i.—iv.
- Pulvis Antimonialis.* gr. iii.—x.
- Antimonium Sulphuratum.
- Antimonium Tartaratum. gr. $\frac{1}{2}$ —i.
- Unguentum.*
- Vinum Antimoniale.* m_v .—x.

Arsenical Preparations—

- Acidum Arseniosum. gr. $\frac{1}{2}$ — $\frac{1}{4}$.
- Liquor Arsenicalis.* m_v .ii.—viii.
- Liquor Arsenici Hydrochloricus.* m_v .ii.—viii.
- FERRI Arsenias. gr. $\frac{1}{2}$ — $\frac{1}{4}$.
- SODÆ Arsenias. gr. $\frac{1}{2}$ — $\frac{1}{4}$.
- Liquor.* m_v .—x.

Bromine Preparations—

- Ammonii Bromidum. gr. ii.—xx.

Chlorine Preparations—

- Ammonii Chloridum. gr. v.—xxx.
- Calcii Chloridum. gr. x.—xx.
- Soda Chlorata.
- Liquor.* m_x .—xx.

Sodii Chloridum.

Potassii Chloridum.

Colchici Cormus. gr. ii.—viii.

Extractum. gr. $\frac{1}{2}$ —ii.

Extractum Colchici Aceticum. gr. $\frac{1}{2}$ —ii.

Vinum. m_x .—xxx.

Colchici Semen.

Tinctura. m_x .—xxx.

Copaiba. m_{xxx} .—3i.

Copaibæ Oleum. m_v .—xx.

Cubeba.

Tinctura. ℥_{xxx}.—ʒ_{ii}.Cubebæ Oleum. ℥_v.—xx.

Hemidesmi Radix.

Syrupus. ʒ_i.

Mercurial Preparations—

Hydrargyrum.

Hydrargyrum cum Cretâ. gr. iii.—viii.*Pilula Hydrargyri.* gr. iii.—viii.*Emplastrum.**Emplastrum Ammoniaci cum Hydrargyro.**Linimentum.**Suppositoria.**Unguentum.**Unguentum Hydrargyri Compositus.*

Hydrargyrum Iodidum Rubrum. gr. ½—⅓.

Unguentum.

Hydrargyrum Iodidum Viride. gr. i.—iii.

Hydrargyrum Perchloridum. gr. ½—⅓.

Liquor. ℥_{xxx}.—ʒ_{ii}.*Lotio Flava.*

Hydrargyrum Subchloridum. gr. ½—v.

*Lotio Nigra.**Pilula Hydrargyri Subchloridi Composita.* gr. v.
—x.*Unguentum.*

Guaiaci Lignum.

Guaiaci Resina. gr. x.—xxx.

Mistura. ʒ_{iv}.—ʒ_{ii}.*Tinctura Guaiaci Ammoniata.* ℥_{xxx}.—ʒ_i.

Iodine Preparations—

Cadmii Iodidum.

Unguentum.

Ferri Iodidum. gr. i.—v.

Pilula. gr. iii.—viii.*Syrupus.* ℥_{xxx}.—ʒ_i.

Plumbi Iodidum. gr. ½—i.

*Emplastrum.**Unguentum.*

Potassii Iodidum. gr. ii.—x.

*Linimentum Potassii Iodidi cum Sapone.**Unguentum.*

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I. Prescribe a regimen to maintain health and good

8

Lignaria *harringtoni* (Walker)

Liquorice

Aqua ad 5*li*.

Misc. First edition. *Engel's edition* contains the 1860 post edition.

The student might have imagined the use of the arseniate of iron, but the proportion of iron in this salt is too insignificant to be of any therapeutical efficacy as far as the iron is concerned. It is always advisable to administer arsenic in the fluid form, and they should be taken immediately after meals. Pain, burning, and irritation of the eyes are to be expected after the administration of a large dose.

2. Order Copaiba in mixture.

R

Copaibæ, 3iv.

Liquoris Potassæ, 3iv.

Tere benè simul, dein adde inter terendum

Syrupi Aurantii, 3i.

Fiat mistura. Capiat cochleare medium ter in die ex cyatho
aquæ cinnamomi.

The above is an excellent form for the exhibition of copaiba. It is also frequently given with spirit of nitrous ether, or it may be made into emulsion by rubbing it first with mucilage, or yolk of egg and sugar, and then adding some aromatic water. One ounce and a quarter of mucilage should be used with each ounce of copaiba.

Copaiba is sometimes given in the form of pill, made by boiling the copaiba with calcined magnesia, when the required consistence will be obtained in twelve or fifteen hours, or with hydrate of lime, in which case the proper consistence is obtained in four or five hours.

A favourite method of administering copaiba is in gelatine capsules.

3. Write a formula for a mixture of Iodide of Potassium and Sarsaparilla.

R

Potassæ Iodidi, gr. xl.

Syrupi Hemidesmi, 3i.

Extracti Sarsæ Liquidi, 3ii.

Decocti Sarsæ, 3v.

Misce. Fiat mistura. Sumat cochlearia duo magna ter in die.

4. Prescribe Iodide of Potassium with a salt of Iron and Cod-liver oil.

R

Potassii Iodidi, gr. xl.
 Syrupi Ferri Iodidi, 3iv.
 Olei Morrhuæ, 3iiss.

Misce. Fiat mistura. Capiat cochleare amplum bis in die.

The syrup of iodide of iron will be at once selected as the most eligible preparation for combination with the other ingredients in this prescription.

5. Prescribe powders consisting of a combination of Grey Powder and Dover's Powder for a child.

R

Hydrargyri cum Cretâ, gr. xii.
 Pulveris Ipecacuanhæ Compositi, gr. iii.

Misce, et in pulveres sex divide, quorum capiat æger unum omnibus sextis horis.

6. Prescribe the Red Iodide of Mercury in mixture.

R

Hydrargyri Iodidi Rubri, gr. i.
 Potassii Iodidi, gr. xl.
 Syrupi Zingiberis, 3iv.
 Aquæ, ad 3viii.

Misce. Fiat mistura. Capiat cochleare magnum sextâ quâque horâ.

The red iodide of mercury, which is insoluble in water, is readily soluble in an aqueous solution of iodide of potassium.

7. Write a formula for Cod-liver oil in emulsion.

R

Olei Morrhuæ,
 Mucilaginis Tragacanthæ, ana 3ii.
 Aquæ Menthae Piperitæ, 3iv.

Tere bene simul ut fiat mistura, cuius capiat cochlearia duo ampla ter in die.

The foregoing formula, which may be prescribed for those who have a disgust for the oil, is taken from Neligan.

TONICS.

Medicines which by imperceptible degrees permanently augment the vigour of the vital functions. They are divided into four groups:—

- I.—Blood Tonics.
- II.—Nervine Tonics.
- III.—Stomachic Tonics.
- IV.—Vascular Tonics.

I.—BLOOD TONICS.

Substances which primarily alter the character and composition of the blood.

They are:—

- Ferri Arsenias. gr. $\frac{1}{8}$ — $\frac{1}{4}$.
- Ferri Carbonas Saccharata. gr. v.—xx.
- Mistura Ferri Composita.* 3i.—ii.
- Pilula Ferri Carbonatis.* gr. v.—xx.
- Ferri et Ammoniæ Citras. gr. v.—x.
- Vinum Ferri Citratis.* 3i.—iv.
- Ferri et Quiniæ Citras. gr. v.—x.
- Ferri Iodidum. gr. i.—v.
- Syrupus.* M_{xxx} .—3i.
- Pilula.* gr. iii.—viii.
- Ferri Oxidum Magneticum. gr. v.—x.
- Ferri Perchloridi Liquor Fortior.
- Liquor Ferri Perchloridi.* M_x .—xxx.
- Tinctura Ferri Perchloridi.* M_x .—xxx.
- Ferri Pernitratis Liquor. M_x .—xl.
- Ferri Peroxidum Hūmidum. 3ii.—iv.
- Ferri Peroxidum Hydratum. gr. v.—xxx.
- Emplastrum Ferri.*
- Ferri Persulphatis Liquor.
- Ferri Phosphas. gr. v.—x.
- Syrupus.* M_{xxx} .—3i.
- Ferri Sulphas. gr. i.—v.
- Ferri Sulphas Exsiccata. gr. $\frac{1}{2}$ —iii.
- Ferri Sulphas Granulata. gr. i.—v.

Ferrum.*Mistura Ferri Aromatica.* ʒi.—ii.*Vinum Ferri.* ʒi.—iv.**Ferrum Redactum.** gr. i.—v.*Trochisci.* 1—6.**Ferrum Tartaratum.** gr. v.—x.**Manganesum,** Salts of.**Morrhuæ Oleum.** ʒi.—ʒi.

Blood tonics are indicated in cases of anæmia, wasting, and scorbutus or scurvy.

1. Prescribe a mixture of Iron, Bismuth and Ammonia.

R*Liquoris Bismuthi et Ammoniæ Citratis,* ʒiv.*Vini Ferri Citratis,* ʒii.*Syrupi Limonis,* ʒi.*Aquæ,* ad ʒviii.

Misce. Fiat mistura, cujus sumantur cochlearia duo magna ter in die.

2. Prescribe Reduced Iron for a child.

R*Ferri Redacti,* gr. iii.*Pulveris Tragacanthæ,* gr. xxx.

Misce, et divide in pulveres sex. Sumat unum bis in die.

Reduced iron is peculiarly adapted for children on account of its freedom from the inky taste which characterizes other iron preparations. It is best given to children in the form of powder or lozenge, and for adults it may be made up into pills with balsam of Peru which prevents oxidation of the iron.

3. Write the formula for a mixture to contain Iron in combination with an alkaline carbonate and a bitter vegetable infusion.

B*Ferri Tartarati,* gr. lxxx.*Potassæ Bicarbonatis,* ʒii.

Syrupi Hemidesmi, $\frac{3}{i}$.
Infusi Calumbæ, $\frac{3}{vii}$.

Misce. Fiat mixta. Capiat cochlearia duo magna bis in die.

Tartarated iron goes well with alkaline carbonates, and, as we have already seen, infusion of calumba or quassia are compatible with iron salts.

II.—NERVINE TONICS.

Medicines which give tone to the nervous system and some of which act as Antiperiodics. Nervine Tonics are indicated in spasmody and other affections of the nervous system, and in cases of nervous debility. Antiperiodics are given in intermittent fever and in intermittent forms of neuralgia.

NERVINE TONICS WHICH EXERT AN ANTIPERIODIC ACTION.

Acidum Arseniosum. gr. $\frac{1}{10}$ — $\frac{1}{2}$.

Liquor Arsenicalis. $\text{m}ii$.—viii.

Liquor Arsenici Hydrochloricus. $\text{m}ii$.—viii.

Sodæ Arsenias. gr. $\frac{1}{10}$ — $\frac{1}{2}$.

Liquor. $\text{m}v$.—x.

Cinchonæ Flavæ Cortex. gr. x.— $\frac{3}{i}$.

Decoctum. $\frac{3}{i}$.—ii.

Extractum Cinchonæ Liquidum. $\text{m}x$.—xxx.

Infusum. $\frac{3}{i}$.—ii.

Tinctura. $\text{m}xxx$.— $\frac{3}{ii}$.

Cinchonæ Pallidæ Cortex. gr. x.— $\frac{3}{i}$.

Tinctura Cinchonæ Composita. $\text{m}xxx$.— $\frac{3}{ii}$.

Cinchonæ Rubræ Cortex. gr. x.— $\frac{3}{i}$.

Quiniae Sulphas. gr. i.—x.

Pilula. gr. ii.—x.

Tinctura. $\text{m}xxx$.— $\frac{3}{ii}$.

Tinctura Quiniae Ammoniata. $\text{m}xxx$.— $\frac{3}{ii}$.

Other Cinchona Alkaloids.

Nectandræ Cortex.

Beberiae Sulphas. gr. i.—x.

Salicis Cortex.

NERVINE TONICS WHICH DO NOT EXERT AN ANTIPERIODIC ACTION.

Argenti Nitras. gr. $\frac{1}{2}$ — $\frac{1}{4}$.

Argenti Oxidum. gr. $\frac{1}{2}$ —ii.

Cupri Sulphas. gr. $\frac{1}{2}$ —ii.

Cuspariae Cortex. gr. x.—xl.

Infusum. $\frac{3}{4}$ i.—ii.

Ferrum. All Salts. *Vide "Blood Tonics."*

Nux Vomica. gr. i.—iii.

Extractum. gr. $\frac{1}{2}$ —ii.

Tinctura. $\frac{1}{4}$ x.—xx.

Strychnia. gr. $\frac{1}{20}$ — $\frac{1}{12}$.

Liquor. $\frac{1}{4}$ v.—x.

Zinci Oxidum. gr. ii.—x.

Zinci Sulphas. gr. i.—iii.

1. Write for a mixture of Arsenic and Cinchona.

R

Liquoris Arsenicalis, $\frac{1}{4}$ xxx.

Decocti Cinchonæ, $\frac{3}{4}$ viii.

Misce. Fiat mistura, cujus sumantur cochlearia duo magna sextis horis post cibum.

A combination of arsenic with cinchona will often prove of service as an antiperiodic when either alone will fail.

2. Prescribe pills of Salicine and Sulphate of Quinine.

R

Salicini, gr. xxiv.

Quiniæ Sulphatis, gr. xxiv.

Extracti Gentianæ quantum sufficit ut fiat massa, divide in pilulas duodecim. Capiat unam ter in die.

3. Write the formula for a mixture to contain Zinc and Phosphoric Acid.

R

Zinci Phosphatis, gr. xii.

Acidi Phosphorici Diluti,

Aquaæ Destillatae, $\frac{3}{2}$ vi.
Misce. Fiat mistura. Capiat partem sextam ter in die.

The foregoing prescription is slightly modified from a formula by Tanner, and illustrates an excellent method of administering phosphate of zinc. This salt is not officinal, but is of great value in the treatment of certain nervous affections. It requires the presence of phosphoric acid for its solution.

4. Prescribe a mixture of Quinine and Beberia.

B

Quiniae Sulphatis, gr. xii.
Beberiae Sulphatis, gr. xii.
Acidi Sulphurici Diluti, mxx.
Syrupi Aurantii, $\frac{3}{2}$ i.
Aquaæ, $\frac{3}{2}$ v.

Misce. Fiat mistura, cujus sumat æger cochleare magnum quâque tertiatâ horâ.

We have given a rather small dose of quinine for the reason that we combine it with beberia, which is sometimes employed as a substitute for quinine. A drachm of sulphate of quinine requires 30 minims of dilute sulphuric acid for its solution in 2 ounces of water, and it requires 80 minims of dilute nitric acid for its solution in 3 ounces of water.

Quinine should not be prescribed with astringent infusions as a tannate of quinine is precipitated, a circumstance which the addition of sulphuric acid rather favours. We have already seen that when quinine is given in acid infusion of roses a turbid mixture results.

III.—STOMACHIC TONICS.

Medicines which act directly as tonics to the stomach improving the appetite and aiding in diges-

tion. They are divided into groups according to their mode of action. 1st. Some act by altering the vascularity of the mucous membrane, and these are indicated in cases of simple debility of that membrane caused by chronic dyspepsia, excessive use of alcohol, &c. 2nd. Others act as tonics through the nervous system, and these are indicated in atonic dyspepsia arising from nervous debility. 3rd. Some stomachics consist of digestive principles and are useful in the dyspepsia of old age, &c. 4th. A fourth group act by altering the state of the lower bowel, and thus relieve morbid conditions of the stomach itself; these are indicated when atonic dyspepsia is associated with a torpid condition of the bowel and liver.

The following are the chief Stomachic Tonics.

FIRST GROUP.

Acidum Hydrochloricum Dilutum. $m_{x.}$ —xxx.

Acidum Nitricum Dilutum. $m_{x.}$ —xxx.

Acidum Nitro-hydrochloricum Dilutum. $m_{v.}$ —xx.

Calumbæ Radix. gr. x.—xx.

Extractum. gr. ii.—x.

Infusum. $\frac{3}{i.}$ —ii.

Tinctura. $m_{xxx.}$ — $\frac{3}{ii.}$

Cascarillæ Cortex. gr. x.—xxx.

Infusum. $\frac{3}{i.}$ —ii.

Tinctura. $m_{xxx.}$ — $\frac{3}{ii.}$

Chirata.

Infusum. $\frac{3}{i.}$ —ii.

Tinctura. $m_{xxx.}$ — $\frac{3}{ii.}$

Cuspariæ Cortex. gr. x.—xl.

Infusum. $\frac{3}{i.}$ —ii.

Gentianæ Radix. gr. x.—xxx.

Extractum. gr. ii.—x.

Infusum Gentianæ Compositum. $\frac{3}{i.}$ —ii.

Mistura. $\frac{3}{iv.}$ — $\frac{3}{i.}$

Tinctura Gentianæ Composita. $m_{xxx.}$ — $\frac{3}{ii.}$

Lupulus.

Extractum. gr. v.—xv.*Infusum.* ʒi.—ii.*Tinctura.* ℥xxx.—ʒii.

Lupulin. gr. v.—x.

Quassia. gr.—xx.

Extractum. gr. iii.—v.*Infusum.* ʒi.—ii.*Tinctura.* ℥xxx.—ʒii.

SECOND GROUP.

Cinchona	}	Vide "Nervine Tonics."
Nux Vomica		
Iron Salts		

THIRD GROUP.

Pepsina. gr. ii.—v.

FOURTH GROUP.

Aloes	}	Vide "Cathartics."
Rheum		
Taraxacum		

1. Prescribe in mixture one of the dilute mineral acids, Tincture of Hop and a bitter infusion.

Rx

Acidi Nitro-hydrochlorici Diluti, ʒii.

Tincturæ Lupuli, ʒi.

Tincturæ Aurantii, ʒi.

Infusi Calumbæ, ʒvi.

Misce. Fiat mistura, de quâ cochlearia duo magna ter in die exhibeantur.

2. Prescribe pills of Pepsine.

Rx

Pepsinæ (B.P.), gr. xxxvi.

Glycerini quantum sufficit ut fiat massa, in pilulas duodecim dividenda, è quibus capiat unam ter in die ante cibum.

The letters (B.P.) in the above prescription are to signify that the Pharmacopœial preparation is to be

used and not Boudault's Pepsine, which is mixed with starch and requires to be given in much larger doses. Pepsine should always be given with, or shortly before, meals.

3. Prescribe Pepsine in mixture.

R

Pepsinæ (B. P.), 3*i.*

Acidi Hydrochlorici Diluti, 3*ii.*

Syrupi Aurantii, 3*i.*

Infusi Cascarillæ, ad 3*viii.*

Misce. Fiat mistura. Cochleare magnum ter in die exhibatur, quâque vice phialam agitando, ut permisceatur pulvis.

The efficacy of pepsine is much increased when it is given in conjunction with dilute hydrochloric acid.

IV.—VASCULAR TONICS.

Substances which give strength to the heart and vascular system. Among them may be enumerated preparations of iron, acid and astringent preparations, the foregoing groups of tonics and, lastly, digitalis which, although a cardiac sedative in large doses, in small doses exerts a tonic effect on the walls of the heart.

1. Prescribe in mixture Digitalis and Iron for a case of cardiac weakness with dilatation of the ventricles.

R

Tinctura Ferri Perchloridi, 3*ii.*

Syrupi Zingiberis, 3*vi.*

Infusi Digitalis, 3*v.*

Misce. Fiat mistura. Capiat cochleare magnum ter in die

EXAMPLES OF PRESCRIPTIONS FOR EXTERNAL
AND LOCAL APPLICATION.

We will conclude our series of Lessons with a few examples of Prescriptions for External and Local Application.

1. Prescribe an anodyne poultice containing Belladonna.

R

Extracti Belladonnæ, 3*i.*

Farinæ Lini, 3*xii.*

Aquæ bullientis, quantum sufficit ut fiat cataplasma ad-
movendum calidè loco adfecto.

2. Prescribe an astringent eye-wash of Alum.

R

Aluminis, gr. **x.**

Aquæ Rossæ, 3*vi.*

Misce. Fiat collyrium, sæpe utendum.

3. Prescribe an anodyne eye-wash.

R

Vini Opii, 3*ii.*

Decociti Hordei, 3*vi.*

Misce. Fiat collyrium, sæpe utendum.

4. Write the formula for an enema of Castor-oil.

R

Olei Ricini, 3*i.*

Mellis, 3*i.*

Mucilaginis Amyli, 3*x.*

Misce pro enemate statim injiciendo.

5. Order a gargle to contain Borax.

R

Mellis Boracis, 3*i.*

Infusi Aurantii, ad 3*viii.*

Misce. Colluentur fauces hoc gargarismate.

6. Prescribe a gargle of Chlorate of Potash.

R

Potasse Chloratis, 3*i.*
 Acidi Hydrochlorici Diluti, 3*ii.*
 Infusi Rosæ Acidi, ad 3*viii.*
 Misce. Fiat gargarisma, sæpe utenda.

7. Write for an injection of Nitrate of Silver.

R

Argenti Nitratis, gr. xviii.
 Aquæ Destillatæ, 3*vi.*
 Misce. Fiat injectio, quæ in urethram injiciatur mane et nocte.

8. Prescribe a liniment containing Chloroform.

R

Chloroformi, 3*i.*
 Olei Olivæ, 3*ii.*
 Misce. Fiat linimentum, quocum fricitur pars affecta ter quaterve in dies.

9. Prescribe a lotion of Arnica.

R

Tincturæ Arnicæ, 3*iv.*
 Aquæ Rosæ, 3*iv.*
 Misce. Fiat lotio, partibus dolentibus applicanda ter in die.

10. Prescribe a lotion of Subacetate of Lead.

R

Liquoris Plumbi Subacetatis, 3*i.*
 Acidi Acetici Diluti,
 Spiritus Vini Rectificati, ana 3*iv.*
 Aquæ Rosæ, 3*ix.*
 Misce. Fiat lotio.

11. Prescribe an ointment containing Sulphate of Quinine.

R

Quiniæ Sulphatis, 3*i.*
 Acidi Sulphurici Diluti, m*xxx.*
 Adipis, 3*i.*
 Misce. Fiat unguentum ter in die utendum.

Our Lessons are now brought to a close, but I would wish to add a few words of earnest admonition. I would desire to impress upon you that even if you have thoroughly mastered the precepts and examples which it has been my privilege to lay before you, you may not yet consider yourselves accomplished prescribers. Let me advise you to lose no opportunity of practical work in the compounding laboratory, and above all things to habituate yourselves to the practice of devising original formulæ.

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